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Economic Method of Drying Foundry Moulds.

IN almost all foundries the drying of the moulds is effected by means of sheets of iron, on which a fierce coke fire is maintained. Here, evidently, is a great loss of caloric, for the drying is only effected by radiation, and in a space where the air has generally free access. In the case of large castings, such as cylinders, fly-wheels, framing, etc., this plan has also the disagreeable effect of producing great heat all around, and the moulders engaged in the same building suffer seriously at times. In addition to this, it is mostly necessary to employ a crane to sustain the frame, or to employ heavy materials which have to be brought to the spot and afterwards carried away again, disarranging the material of the foundry and giving rise to unnecessary work.

No improved method had been attempted that we are aware of until a few months since, when M. DEHAMME invented and patented a plan which was introduced four months ago into the foundry of MM. QUILLACQ and Co. at Anzin, of which M. DEHAMME is foreman.

The arrangement is very simple. Near the most convenient end of the mould a hole is dug in the ground, and in this is placed a coke stove, which communicates with the mould by means of a short horizontal pipe, through which all the gases of the coke pass. On the other end of the mould is mounted a chimney-pipe, the upper end of which is carried out through the roof or side of the foundry. In the chimney is a damper to regulate the draught. The stove being partially or entirely sunk in the ground, there is little or no radiation from that, and little loss of heat, and consequently of fuel, as the whole of the gases enter and pass through the mould, and are at once carried away by the pipe into the open air.

The economy is great. In certain cases in which, according to the old method, it would have required a ton of coke to dry the mould, it is effected by the new mode with one-fifth of that quantity; the saving is, however, not generally so great as this, but is said to amount on the average to 50 per cent. During the four months that M. DEHAMME'S system has been at work at Anzin, it has realized an economy of 600 to 700 fr. per week in the saving of coke alone, and the lighting which, in the old time, consumed seven steres of wood per month, is now easily effected by means of a few shavings or pieces of waste wood.—*Iron.*

Blasting Experiments.

Some interesting experiments with cotton gun powder as a blasting agent were performed last week at the celebrated quarry of Craigleith, near Edinburgh, for the purpose of showing the superiority of the material manufactured by the Patent Cotton Gunpowder Company (limited) over ordinary gunpowder and dynamite in blasting, rock cutting, and excavations generally. The experiments, which were superintended by Mr. RAMSAY L'AMY, of Netherbyres, the chairman of the company, were conducted in the presence of the managers of the quarry and a number of other spectators. The explosive material used on the occasion was that termed "Brand B.M., No. 2," and its chief advantages are said to be immunity from the danger of explosion in transit and in storage, absence of smoke and of noxious fumes, fitness for service at all seasons and in all climates, and excellence of work. The powder is supplied ready for use in weighed charges. If set fire to it will only deflagrate, and will not explode unless very strongly confined. It is also desirable to employ the material in charges, in order to avoid spilling and wasting the powder.

As with dynamite, this cotton gunpowder is exploded by the use of detonators. Each charge has inserted into it one of these detonators, which are copper caps, about 1 inch long, and are filled with at least ¼ inch of fulminating powder. The results of the experiments at Craigleith Quarry may be said to have maintained the character and extended the reputation of the material. After some preliminary arrangements, several small cartridges, containing a total quantity of 40 ozs. of powder, were placed in a bore-hole 11 feet deep, and 2 in diameter. The explosion was comparatively noiseless, and it was found that although the rock which it was intended to blast had not been completely removed, yet it had been cut so as to render quarrying very easy, as well as profitable. The important fact in connection with this experiment was that the 40 ozs. of material did as much work as 192 ozs. of ordinary gunpowder, and in a manner much more acceptable to quarrrymen. The next experiment was almost a failure, owing to the cartridge having stuck in the middle of the bore-hole, and the consequence was that the charge went off like a cannon, and did no work.

To show the relative value of gunpowder and patent cotton gunpowder in cutting the rock, a charge of 30 lb. of gunpowder was placed in a bore-hole 12 feet deep and 4½ inches in diameter. The explosion was terrific, pieces of rock being sent hundreds of yards into the air, and the solid block in which the bore-hole had been made being completely shivered at the surface but scarcely injured 12 feet down. In respect of good work, the quarrymen had no hesitation in preferring the patent cotton powder to ordinary gunpowder; and, seeing that its force in ordinary cases is four times greater than that of gunpowder, they could scarcely withhold superiority in respect of power.

In order to demonstrate the safety, and even impunity, with which the powder may be handled Mr. L'AMY divided a cartridge and set fire to it, when it simply burned like an ordinary torch.

Prof. ATTFIELD has lately performed some experiments with his new powder. He says that a mass of iron weighing half a ton was let fall from a height of 15 feet on to a box containing 10 or 12 lb. of powder. There was no ignition or explosion. An unusually well-made powder-barrel, strongly hooped and headed, containing between 39 and 40 lb. of the powder, in the form of cartridges of various sizes, was placed over some faggots saturated with tar, and a large bonfire kindled. In four minutes the cartridges ignited, and merely burned for some 30 or 40 seconds. Every cartridge was entirely consumed without any explosion whatever. A cartridge was placed in an open box containing 2 lb. of common powder, and the latter fired by a fuse; the cartridge was blown some yards, but not exploded. The cartridge was afterwards fired by the usual means.

On the Evolution of Heat During the Hydration of Clay-Slate, Clay and Coal.

Mr. WM. SKEY, in the *Chemical News*, discribes some experiments which he made and from which it appears:

1. That in the disintegration of rocks or soils heat is evolved.

2. That the difference in temperature sometimes observed between contiguous strata may be due, wholly or partly, to this cause.

3. That our native anhydrous coals hydrate upon their surfaces when exposed to water or acqueous vapor.

4. That hygroscopic water is chemically-combined water.

5. That the quantity of water present in certain rocks or minerals may, when known, frequently indicate the highest temperature to which they have been subjected.

6. That the bulk of vegetable matters (leaves, twigs, &c.) generally develop heat by hydration, also by friction, when the temperature of the air surrounding them is lowered.

In regard to these statements it requires, in the case of 3, gravimetrical experiments to support it, which I shall presently endeavor to obtain, and if they should prove it a correct one, that is, that anhydrous coal can hydrate and to any notable extent, it will certainly appear that these substances have been formed at a somewhat elevated temperature, perhaps approaching to nearly 100° C.

While upon the subject of the formation of coal, I cannot avoid thinking the effects of pressure in consolidating this, and indeed other minerals, also rocks, have been considered much greatert han they really have been or are now, and this because it seems that these subjects will generally, if not always, be charged with water, oil, or gas, and, if this is so, I conceive the consolidating action of pressure would be very greatly mitigated, and would be in some proportion to its actual volumetrical effect upon the liquid receiving it. I cannot see how particles suspended, or thoroughly soaked with a liquid, can be made to approach each other by pressure, except by allowing the liquid to escape, and it does not appear, in the case of rocks, &c., at some depth, that there can be any such way of escape, at least a sufficiently ready one for the liquids or gases lodged in their pores.

A Sulphur Region.—The Winnemucca (Nevada) *Silver State* says: "Right here in Humboldt, within a hundred yards of the Central Pacific railroad, and in the immediate vicinity of the silver mines of the Humboldt range, are beds of sulphur capable, it is believed, of supplying the whole world with that article for centuries. These sulphur deposits are located in the Humboldt valley, not much over a mile from the Humboldt House, and probably thrice that distance from the base of the Humboldt range. But little is known in reality of the extent of the beds, except that they cover a large area in the valley, and have been prospected in one place to a depth of several feet, where the excavations expose hundreds of tons of the pure article, which can be made available for commercial purposes at no greater expense than loading it on the cars and shipping it to the great commercial centers."

Economy of Fuel in our Anthracite Blast-Furnaces.*

By B. W. FRAZIER.

CONTINUED FROM PAGE 18.

Table III. gives a balance sheet of the materials introduced into, and the products issuing from, the furnace. In constructing it, I have made the following assumptions:

1st. The pig iron consists of Fe 94, Si 2, Mn 1, C 3 — 100

I have neglected the sulphur and phosphorus, as the amounts of these substances in the ore and fuel are not given.

2d. The coal consists, as Mr. CHURCH assumes, of Carbon, 85; Ash, 10; Water and volatile matter, 5 — 100

I have assumed that the volatile matter consists of H^2O, neglecting the excess of H, which the volatile portion of anthracite contains.

3d. The ashes of the coal consist of SiO^2 43, Al^2O^3 47, CaO 10

4th. The weight of moisture contained in the blast is 0.0062 times the weight of the dry blast.

5th. There have been left out of the account, on the one side, the weight of alcalis introduced in the charge, and, on the other, the weight of dust or fume carried out by the gases.

TABLE IV.

HEAT REQUIREMENT OF FURNACE USING SELF-FLUXING CHARGE OF ORE.

1. Evaporation of water in fuel and ore,	0.158×606.5	96
2. Reduction of iron oxide,	0.314×1887 593 / 0.626×1665 1041	1634
3. Carbon impregnation	0.03 ×2473	74
4. Expulsion of CO^2 from CaO CO^2	0.5679×373.5	212
5. Decomposition of Co^2 of do.	0.1662× 3	399
6. Reduction of SiO^2 &c.	0.03 ×7000	210
7. Decomposition of moisture of blast	0.0031×29000	90
8. Carried off by pig iron		337
9. Carried off by slag	0.8097×550	445
10, 11 and 12. Losses		400
13. Carried off by escaping gases	7.0092×0.237×287°	477
		4374

HEAT PRODUCTION OF SAME FURNACE.

1. Brought in by blast	5.105×0.239×480°		586
0.90 C to CO at tuyeres		2226	
0.019 C to CO in reduction of SiO^2 &c.,		47	
0.071 C to CO in reduction of CO^2 expelled from charge		175	
0.127 C to CO in reduction of CO^2 produced by reduction of iron oxides		314	
2. 1.117 C to CO		2762	2762
3. 0.427 CO to CO^2 by reduction of iron oxides			1026
			4374

Weight of carbon consumed per ton of pig=1.t 117, equivalent to 1.t 314 coal @85 per cent. C.

The resulting cinder is highly aluminous, but not more so than the slags of some Cleveland blast furnaces, mentioned by Mr. BELL, which it closely resembles in composition.

Table IV. gives the heat requirements of a furnace using this mixture of ores, and shows the manner in which the heat is developed. I have adopted Prof. GRUNER'S co-efficients, which were used by Mr. CHURCH for the anthracite furnace of 1869-73, but have made the table of heat production according to the views of Mr. BELL. In order to render the comparison independent of the working of the furnace, I have assumed that the quantity of CO^2 produced from the reduction of the oxide of iron, which has been reduced to CO, is the same as in the anthracite furnace of 1869-73. As there is less water in the charge to be evaporated, I have assumed that the temperature of the escaping gases is somewhat higher (287°C instead of 260°C.)

The results are a total heat requirement less than that of any of the other furnaces which have been mentioned, and a consumption of 1.314 tons coal per ton of pig, which represents a saving of 0.67 ton or 13½ cwt. of coal per ton of pig, effected by this mixture of ores. It is not likely that this or similar calcareous ores will ever be found in such quantities as to be extensively used in our anthracite furnaces in the proportions above given. Where it is practicable, however, the foregoing calculations show that the mixture of a calcareous ore, though a lean one, with some of our highly siliceous ores would be productive of a considerable economy of fuel.

Another method by which economy of fuel may be effected is, as pointed out by Mr. CHURCH, the improvement of the working of the furnace in such a manner that the iron oxide may be reduced as much as possible by carbonic oxide, and that the resulting carbonic acid may escape as such, without suffering reduction. This reduction of carbonic acid by the solid carbon of the fuel entails a loss of fuel in two ways:

1st. Every pound of carbon in the carbonic acid carries off with it a pound of carbon from the fuel, thus diminishing the quantity of carbon which reaches the tuyeres.

2nd. The reduction absorbs heat, to such an extent that the reduction of a quantity of carbonic acid, containing one pound of carbon, requires slightly over one pound and a quarter of carbon to be burned uselessly at the tuyeres, merely to supply the requisite heat.

With regard to the maximum of economy that can be attained in this direction, the opinions of metallurgists vary. Mr. CHURCH has assumed that the proportion between the carbonic acid and the carbonic oxide in the escaping gases, which corresponds to the maximum of economy, is 0.70

MR. BELL, in his estimate of the minimum quantity of fuel required by a furnace smelting Cleveland ores, assumes that the maximum quantity of carbonic acid, which can exist in the escaping gases, is the sum of the carbonic acid formed by the reduction of the iron oxide of the ore, and of that which is formed by the splitting up of carbonic oxide into carbon and carbonic acid in such quantity as to supply the carbon of the pig iron.

Prof. GRUNER assumes that the maximum quantity of carbonic acid in the escaping gases is the sum of the carbonic acid due to the reduction by carbonic oxide of the iron oxide of the ore, and of that which is expelled from the carbonates of the charge. These assumptions of the two latter authorities are in accordance with their respective assumptions with regard to the reactions in the blast furnace, which have been already stated. It should be mentioned that Mr. BELL'S estimate has been but slightly exceeded by his own furnaces, and represents, consequently a degree of excellence in working which has been nearly attained. Prof. GRUNER'S estimate represents, what he calls the ideal working of a furnace and the corresponding consumption of fuel is considerably less than has as yet been found necessary in practice. Mr. CHURCH'S method of estimating the amount of fuel corresponding to the ideal working of a furnace has the disadvantage of not being applicable universally to furnaces under different conditions. The proportion between the carbonic acid and the carbonic oxide in the escaping gases of a furnace depends not only upon the working of the furnace, but also upon its heat requirement. Two furnaces working equally well, but with different heat requirements, would necessarily have different ratios between carbonic acid and carbonic oxide in their escaping gases.

Let us see what are the quantities of fuel corresponding to the greatest economy of working, according to these different assumptions, for the anthracite furnace of 1869-73.

The amount of oxygen contributed to the gases by the iron oxide of the ore is, in this furnace, 0.397 ton per ton of pig. This corresponds to 1.092 ton carbonic acid. 0.03 ton of carbon is supplied to each ton of pig (according to Mr. BELL) by the dissociation of 0 14 ton carbonic oxide into 0.03 ton carbon and 0.11 ton carbonic acid.

The maximum weight of carbonic acid in the escaping gases per ton of pig is, then, according to Mr. BELL,

1. From reduction of iron oxide	1.092	ton.
2. From dissociation of carbonic oxide	0.11	"
	1.202	"

The heat requirement of the furnace, according to Mr. BELL, is 6180 heat units.

To find the amount of heat which must be supplied by the combustion of carbon to carbonic oxide, there must be subtracted from the total heat requirement the amount of heat developed by the oxidation of CO to CO^2, and that introduced by the blast.

0.795 ton CO to 1.202 ton CO^2 produce	1838	heat units.
Blast introduces	898	"
	2736	"

Subtracting this sum from 6180 (the total heat requirement), we find that 3444 heat units are to be developed by the combustion of C to CO. This quantity of heat would be developed by the combustion of 1.393 ton carbon to carbonic oxide.

The result is, however, merely an approximation to the truth, for we have omitted to take into account the fact that, when the quantity of fuel is diminished, the heat requirement of the furnace is somewhat diminished, and that the quantity of heat introduced by the blast also decreases, if the temperature of the blast remains constant. Whether the result of these corrections will be an important diminution in the quantity of heat to be supplied by the fuel, will depend mainly upon the temperature of the blast and that of the escaping gases. When, as in the cases before us, the temperature of the blast is considerably higher than that of the escaping gases, there will be but a slight diminution in the quantity of heat to be developed by the fuel..

1.393 ton carbon corresponds to 1.639 ton coal of 85 per cent. carbon. The difference between this latter weight and 1.982 ton (the weight of coal employed per ton of pig in the furnace of 1869–73), or 0.343 ton, represents the saving in fuel.

As the fuel is assumed to contain 10 per cent. of ashes, there would be 0.0343 ton less ashes to flux containing 0.019 SiO^2. This would render possible a diminution of 0.0571 ton in the charge of flux, containing 0.024 ton CaO MgO. The saving in the heat requirement would be composed, as follows, of:

1. Evaporation of moisture,	0.0201×606.5	12.
4. Expulsion of CO^2 from flux.	0.04×373.5	15.
5. Decomposition of CO^2 of do.	0.016×2403	38.

*A paper read before the American Institute of Mining Engineers at Hazleton, October, 1874

7. Decomposition of moisture of blast.	0.0062×3222×1	20.
9. Carried off by slag.	0.0889×550.	49.
13. Carried off by gases.	1.33×0.237×260°C.	83.
		217.

The diminution in the amount of heat brought in by the blast would be

$$1.\times 0.239\times 482^{\circ} = 114.$$

Deducting this quantity from the saving in heat requirement, we find that with a saving of 0.343 ton of fuel, the heat to be developed by the fuel would be less by 103 heat units. This corresponds to very nearly 0.042 ton carbon or 0.05 ton coal.

Deducting this amount from the first approximation, we obtain for a second approximation, which is quite close enough for our purpose. the weight 1.59 ton of fuel as the minimum quantity, which, according to Mr. BELL's views, could supply the heat requirements of the furnace of 1869-73.

This represents a saving of about 0.39 ton or nearly 8 cwt. of coal per ton of pig. The amount of CO^2 in the escaping gases would be:

	tons.
per ton of pig.....	1.202
and of C O.....	2.864

The ratio $\frac{CO^2}{CO} = m = 0.42$

If we adopt Prof. GRUNER's assumptions, and apply a similar method of calculation, we find the total heat requirement of the furnace to be....5188 heat units. From this we deduct:

1. heat introduced by the blast.....	898
2. heat produced by combustion of 0.695 CO to CO^2	1670
	2568

This leaves 2620 heat units to be supplied by the combustion of carbon to carbonic oxide. This amount of heat would be produced by the combustion of 1.059 ton C to CO. Adding 0.03 ton carbon for the impregnation of the pig, we find that 1.89 ton carbon, corresponding to 1.28 ton coal, would be required.

Deducting 0.10 ton coal as representing approximatively the saving in fuel from the diminution in the heat requirement, we obtain 1.18 ton coal for the amount of fuel representing Prof. GRUNER's ideal working of a furnace with the heat requirement given. This corresponds to a saving of 0.802 ton coal, or about 16 cwt. per ton of pig. The amount of CO^2 in the escaping gases would be, per ton of pig, 1.692 ton, and of CO, 1.575.

The ratio $\frac{C\,O^2}{C\,O} = m = 1.074$

Mr. CHURCH, by fixing the ratio $\frac{C\,O^2}{C\,O} = m$ at 0.70, calculates that the ideal working would be attained with a consumption of 1.380 ton coal, corresponding to a saving of 0.6 ton, or 12 cwt. coal per ton of pig.

Finally, if we make similar calculations for the furnace with a self-fluxing charge of ore, the heat requirement of which has been calculated above, we find that according to Mr. BELL's views 0 90 ton, and according to Prof GRUNERS', 0.765 ton coal per ton of pig, would correspond to the greatest economy of working, representing a saving, in comparison with the anthracite furnace of 1869-73, of 21¼ cwt., and 24 cwt., respectively.

TO BE CONTINUED.

Coal Cutting Machinery in England.

The following extract from the *London Mining Journal* gives the present condition of the coal-cutting-machine question in England. It has been proved repeatedly that by the application of coal-cutting machinery it is possible to work coal at a considerably less cost than by hand, the difference of cost varying, of course, according to the capacity of the machine employed and the nature of the seam upon which it is set to work. Like all great revolutions, the introduction of mechanical appliances in the getting of coal makes its way but slowly, and it may be that the events of the past year have not materially facilitated the result of substituting generally mechanical appliances for hand labor in the getting of coal. But in a quiet and unobtrusive way progress has undoubtedly been made. Increased attention has been paid to the economic effects of using coal-cutting machinery, and numerous experiments have been made at different collieries with the machines of the Messrs. BAIRD, FIRTH, JONES, WINSTANLEY, CLAPP, and some others, all tending to show that the barriers of prejudice are being broken down, and that upon the removal of certain now current doubts and obstacles the great achievement aimed at by the numerous patentees of coal-cutting machinery, and by men like FIRTH, and LINDLAY WOOD, of Hetton, who have incurred enormous cost in perfecting such appliances, will become a *fait accompli*. Coal-cutting machines have not hitherto been more generally adopted because in most cases it involves a very large first cost to set them in operation, although the machines by themselves do not cost more than £150 to £250; because the laying down of such machinery will interfere to some extent with the work of the colliery; because there is a want of agreement as to the best machinery actually at work, and because of prejudice and obstruction on the part of masters on one hand, or of the men on the other. The last difficulty is melting away, the first is easily surmountable, the second is less a difficulty now (when profits are so little) than at any time during the last four years, and it will probably never be found that for all purposes and in every respect one particular machine is better than all its rivals, any more than it is now agreed that one particular form of engine is superior to all others. The Messrs. BAIRD, of Gartsherrie, have now built a large establishment exclusively for the manufacture of the machine that bears their name, and at a number of the principal Scotch collieries, the Gartsherrie machine is now in successful use, while the other machines, such as those of FIRTH, WINSTANLEY, and HURD are making fresh converts on this side the Border. It seems, therefore, that although the progress is slow, there is undoubted progress being made with this most important phase of the coal question, and quite as much has been done in this direction during the past year as in any of its predecessors.

The Richmond Coal Field.

AT the Hazleton meeting of the American Institute of Mining Engineers, the following discussion took place, after the reading of Mr. HEINRICH's supplementary paper on Deep Borings with the Diamond Drill, published in our number of Dec. 26, 1874.

Mr. MARTIN CORYELL: I can confirm, from personal observation, all that Mr. HEINRICH has said about the machinery he employs. He has made many improvements in the apparatus furnished him by the manufacturers, increasing it both in strength and in simplicity. The geological results of his explorations will prove, when published, to be highly important. It is certain that the coal basin, as h therto worked, does not rest immediately upon the granite, there being a large mass of slates between. The coal presents a series of anticlinals and synclinals, and, where sufficient area is owned and the mines are scientifically worked, the extraction may be very cheaply effected. During the rebellion, the mining operations were based upon the outcrops only, and the mines were very badly handled. Slate being sent to market with the coal unnecessarily damaged its r putation. In point of fact, there are at least 18 feet of excellent coal. The notion that it lies in pockets only, is another mistake. There is nothing to indicate great disturbances in the basin.

Prof. T. STERRY HUNT: Can Mr. HEINRICH tell us anything about the supposed alteration of coal in that region by igneous rock, or about the occurrence of carbonite?

Mr. O. J. HEINRICH: Trap dykes are found penetrating the coal and apparently changing it to coke. At least mineral coke lies close to the dykes. The carbonite in some parts of our series is a puzzle, because it overlies bituminous seams and we find no dykes near. I have seen, in North Carolina, inferior anthracite close to an igneous dyke, but the occurrence is entirely local, and passes at 30 or 40 feet distance into bituminous coal. How to account for the carbonite overlying the bituminous coal, I do not know. There are different varieties of the carbonite. One kind, called popping coal, pops, when put in the fire, like a battery of artillery. Some of the natural coke, though compact, silvery, and yielding a ringing tone, will likewise pop; but some does not. The carbonite shows a similarly various behavior. This may be due to sulphur or to the property of taking up moisture and giving it out again. Popping carbonite, however, has a columnar structure.

Prof. HUNT: Prof. WURTZ infers from analysis that carbonite is not coke at all, since it gives off several hundred thousandths of hydrocarbons, and cannot, therefore, be the product of heat on bituminous coal.

Mr. CORYELL: There is a vein of carbonite five feet thick on the north side of the James River. This seam, I have been told, divides, as it goes toward the river, and three feet of bituminous coal are found under it. I have heard it suggested by geologists that trap may have overflowed this bed; but it now appears, in the openings, as if changed by chemical action in the coal itself. It is used as fuel in Richmond and on some railways, and has been introduced even in New York. It is the carbonite from the south side of James River, I believe, which pops like hemlock in the fire.

Mr. HEINRICH: I made, before the war, one analysis, the exact result of which I do not now recollect; but I feel sure that the volatile matter in the carbonite was not more than 12 to 15 per cent., mostly water. There was much ash.

Notes.

Selenide of Bismuth.—A selenide of bismuth has been found in a mineral of the mining district of Guanaxuato, having, in addition to selenium and bismuth, a slight trace of zinc and some iron.

Discovery of a Bed of Nickel in Norway.—It is announced that a very rich bed of nickel has been recently discovered in the forest of Glörud in Norway. The ore proves to contain 3.59 per cent of pure metal; an exceptionally large proportion.

The Wheatley Copper Works of Phoenixville, are again in operation and on Tuesday last 7,000 pounds of ingot copper were produced, and another lot will be run in a few days. Mr. Wheatly has large quantities of rich copper ores and others are arriving.

College of Mines, University of California.—The College of Mines, in the University of California, is being rapidly organized, so that full opportunities may be afforded for the training up of mining engineers and metallurgists on this coast. This department of the University is not yet in full running order, although courses of lectures on subjects connected with mining are now being delivered. It is not proposed to organize a special class in the College of Mines until next year.

The Chemical Copper Company of Phoenixville, Pa., with Charles M. Wheatley, Esq., as President, and Walter S. Church as General Superintendent, was organized on January 1st, and already has the construction of a building been commenced, which will contain a steam engine of forty-horse power, a crusher and a number of tanks arranged three tiers high; also a building which will contain four roasters, each having three chambers. These buildings are located immediately below the Wheatly Copper Works. The Company is composed of New York capitalists who will redu ceores by the Hunt and Douglas process. It is expected that the new works will be built and in operation by the 1st of May, and will give employment to quite a number of men.

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Phosphor Steel.

In our article of November 28, 1874, on Soft Phosphor Steel, we said, on what we considered at the time good authority, speaking of the results at Terrenoire :

"It is thought that good rails can be successfully manufactured from one-third old iron rails, one-third good ore, and one-third steel scrap, the Siemens-Martin process being employed, with the substitution of ferro-manganese for spiegeleisen. M. JORDAN, President of the Institution of Civil Engineers, is said to be strongly of this opinion."

The name of JORDAN stands so high as an authority in the metallurgy of iron and steel, that this statement was certainly important, if true. Hence it is equally important to acknowledge a correction of it, furnished by a letter just received from Prof. JORDAN himself, in which he says that he does not think he ever expressed the opinion thus attributed to him, and that he has heard no talk in France of the manufacture of steel from such mixtures as are given in our article. Some heats were made at Terrenoire in the presence of the Engineers of the Northern railway, for which the rails were destined. In these cases the charges had about the following composition : 1,600 kilos of phosphorous iron (old rails) and iron scrap ; 1,600 kilos of steel waste and scrap ; 900 kilos of pig. and 70 kilos of ferro-manganese. From this mixture rails were obtained which satisfied all the tests imposed. But there was no ore in the bath ; and Prof. JORDAN does not consider himself in a position to pronounce a definite opinion as to the success of manufacturing steel from ore and pig on this plan. His views were expressed, in February, 1874, at the meeting of the Society of Civil Engineers, at which M. EUVERTE, director of the works at Terrenoire, made his communication to the society. On that occasion, M. JORDAN said merely that the works referred to appeared to have found, thanks to ferro-manganese, the means of transforming phosporous rolled rail into phosphorous cast rails. In reply to a question from him, M. EUVERTE said that they had not yet manufactured steel with phosphorous ores, but he did not despair of succeeding in that.

The branch of the MARTIN process which employs pig and ore, instead of pig and wrought iron or steel scrap, for the manufacture of hearth steel, is in successful operation at SIEMENS' works at Llandore, Wales, at the Steel Works of Scotland, and elsewhere in Great Britain. But these works (which produce excellent steel at a price not far from that of the Bessemer metal) do not use ores containing phosphorus. On the contrary, we think they employ for this purpose nothing but the pure Spanish hematites, the freedom of which from phosphorus is notorious.

The Reports on Mining Statistics.

THE Report of the United States Commissioner of Mining Statistics rendered in February, 1874, and containing the statistics of 1873, is in print at Washington ; but the resolution ordering the usual edition for public distribution failed to pass the House last Spring, and now awaits the action of a conference committee. The delay is very annoying ; but "nobody is to blame," unless it be Louisiana, the Tariff, the Currency, etc., etc. !

The following document addressed by the Territorial Delegates to the Committee on Appropriations, is a cheering evidence of the value attached to these reports by the communities most directly interested in them :

HOUSE OF REPRESENTATIVES,
WASHINGTON, D. C., Jan. 7, 1875.

The undersigned, Delegates from the Territories of the United States to the House of Representatives, respectfully urge the Committees of the House and Senate on Appropriations to report in favor of the appropriation of a sufficient sum by Congress for the continuance of the collection of mining statistics, as heretofore carried on by the Special Commissioner, Prof. R. W. RAYMOND, whose annual reports hitherto published have been eagerly sought for by our people at home and men of science, capitalists and skilled laborers abroad. They have been of the greatest service in the development of our mineral resources and in the spread of the latest information concerning the best methods of mining and processes of metallurgy. In our opinion and the opinion of our constituents, it would be a calamity to the mining districts if this work should be stopped or crippled. If any public work whatever is to be carried on in the West, to assist the development of the resources of the country, the labors of Prof. RAYMOND and his assistants are certainly entitled to the support of the Government, by virtue of their valuable results during the nine years that have elapsed since the policy of making known the mineral wealth of the country was adopted by Congress.

Signed) R. C. MCCORMICK, Arizona.
J. B. CHAFFEE, Colorado.
M. K. ARMSTRONG, Dakota.
JOHN HAILEY, Idaho.
MARTIN MAGINNIS, Montana.
S. B. ELKINS, New Mexico.
GEO. Q. CANNON, Utah.
O. B. MCFADDEN, Washington.
W. R. STEELE, Wyoming.

Tapering Wire Ropes in Deep Mining.

THE Savage Company, working on the Comstock lode, Nevada, is putting in machinery with the object of sinking their slope to the enormous depth of 4,000 feet. These engines are two 24-inch horizontal cylinders, 4 feet stroke, of 400 estimated horse power. The steel wire rope to be used is now being made by Messrs. ROEBLING'S SONS, of Trenton, N. J ; it will be 4,000 feet long, round section, tapering for 2500 feet of its length, the upper end being 2 inches diam., the lower 1¾ inches; it will weigh about 24000 lb.

The use of tapering wire ropes has advantages in deep shafts that have not yet attracted much attention in this country though they are in general use in Europe, especially in France and Belgium. Probably one of the chief reasons for their not having been more generally used here, has been that our shafts in the coal regions are of moderate depth, where the difference in weight between a tapering and a uniform section rope would be but little, while our long slope ropes which wear out by friction on the lower end and are then generally turned end for end, of course must be of uniform section throughout. As our mines become deep, there will be a great advantage in using conical or tapering ropes in which the section of the rope at any point is proportioned to the load it has to carry.

The Messrs. ROEBLING are now making ropes of this kind with the same number of wires throughout, and a continuous taper.

The following rules will be of interest to those having occasion to use wire ropes in deep shafts.

The safe or working load should be from one-seventh to one-fifth of the breaking strain, according to the conditions under which the rope is used ; the greater the vibration and velocity of the rope, the greater should be the allowance for safety.

The weight of wire rope is about one-sixth (or .167) of a lb. per cubic inch, or two lb. per foot in length per square inch section, and the proportion between the weight of a rope and its working load is as follows :

	Steel.	Charcoal Iron.
Weight per foot of rope for one ton (2,000 lb.) working load	⅓ lb.	½ lb.
Length of rope of uniform section, at which the weight of the rope is equal to its working load	6,000 ft.	4,000 ft.

Rule for finding the section at any point of a *Taper rope of uniform strength.*

S = section of rope in inches.
W = weight of wagon, cage, etc , applied at the end of the rope.
w = weight of one foot in length of the small end of the rope.
x = distance in feet from the end at which W is applied to the section S.
e = 2.7183.
f = working or safe strain in lb. per square inch section of the rope.
= 12,000 lb. for steel.
= 8,000 lb. for charcoal iron.

$$S = \frac{W}{f} e^{\frac{wx}{f}}$$

The weight of the rope for x feet from the end is

$$fS. - W = W\left(e^{\frac{wx}{f}} - 1\right)$$

The working load (f) is made up of the weight applied at the end of the rope (wagon, mineral cage, etc.), of the weight of the rope itself, and of the energy ex-

erted in imparting velocity to the load. In shafts hoisting at a great speed this is an important item in the load ; it is expressed by the formula

$$\frac{W^1 V^2}{2g} \text{ in which}$$

W^1 = the load in lb.
V = increase in velocity in a second.
g = 32.2 = gravity.

If we take for example a shaft where $W^1 = W + W^0 = 15{,}000$ lb., W^0 being the weight of the rope, the velocity attained in the first second = $V = 10$ feet, we have the energy expended in getting up this velocity

$$\frac{W^1 V^2}{2g} = \frac{1{,}500{,}000}{64.4} = 2329 \text{ lb.}$$

which amount has to be added to $W + W^0$ in order to get the working strain on the rope, when we neglect the friction on the guides, the resistance of the air, rigidity of the rope, friction of sheaves on their axles, etc., which are smaller in amount, and are provided for, as is also the wear and tear of the rope, in the margin of 5 to 1 or 6 to 1, which is allowed for safety in the use of wire ropes.

Wastefulness in Coal Mining and the Broad Top Coal Trade.

THE itemization of the cost of "a ton of coal in the cars," or on the market, is the only means of arriving at a correct appreciation of the economy or wastefulness with which any particular part of the work is performed.

If, as we recently remarked was the case in working the great vein of the Cumberland region, very considerably less than one-half of the coal in the beds be obtained in merchantable condition, it must be very evident that it is high time to ascertain the cause of this and apply the remedy. A continuance of such a wasteful system of work is not only ruinous to the companies, but wholly unnecessary in the present condition of the art of mining. That at least one-half of all our anthracite coal is wasted, either in pillars left in the mine, or in the preparation for market, is a standing reproach to those in charge of this enormous interest ; for, so far as we know, absolutely no serious effort has been made by any of the large companies, which practically own the anthracite fields, to introduce a less wasteful system of mining than was in use twenty years ago. Consumers have, of course, to pay for the waste, and the higher price which the coal necessarily commands tends to limit its use, and, with that, the general business of the country.

There are, however, many other causes of waste in coal mining than that measured by the proportion of coal lost. Everything that unnecessarily increases the cost of coal is waste, whether it be in the form of an excessive amount of labor, or the investment of an unnecessary amount of capital for the ton of coal produced. We propose to draw a lesson from the following interesting and valuable table of the *Broad Top Coal Trade* which we have received from the well known engineer of the Huntington and Broad Top Railroad Company. It is very instructive and suggestive. These figures show very conclusively that there is vast room for the exercise of economy in the manner of conducting the mines of that region.

BROAD TOP SEMI-BITUMINOUS COAL TRADE.

STATEMENT exhibiting the amount of Coal mined and sent to market in 1874, from the Collieries of the Broad Top Semi-Bituminous Coal Region, with present facilities, and estimated capacity for 1875. Furnished by JOHN FULTON, Mining Engineer.

Name of Colliery.	Name of Proprietor.	Name of Operator.	Tons net sent to market in 1874.	Number of Miners at Colliery.	Number of other workmen.	Number of Miners' Houses.	Galleries or Rooms in working order	Average capacity in tons per day.	Estimated value of colliery improvements.
1. Coalmont	Chandler & Peabody	....	....	..	2	11	12	40	$80,000
2. Cumberland	H. and B. T. RR. Co	J. Whitehead & Co	6,207.3	..	..	5	20	70	12,000
3. Crawford	do. do.	" "	28.1	..	..	8	10	25	15,000
4. Powelton	R. H. Powel & Co	R. H. Powel & Co	37,650	60	25	50	100	260	150,000
5. Barnet	Orbison Dorris & Co	R. U. Jacobs & Co	22,438.2	40	12	10	25	80	30,000
6. Dudley Slope	Wood & Bacon	J. M. Bacon	855.1	..	..	23	15	25	40,000
7. Blair's	David Blair	" "	10,125.2	10	3	13	20	50	25,000
8. Howe	do do	" "	9,790.2	16	2	..	15	50	10,000
9. Moredale	Semi-Anthracite Co	Beakirt Bro. & Co	20,563	35	3	36	30	100	20,000
10. Fishers	Fishers & Miller	Fishers & Miller	18,077.1	37	3	17	25	125	25,000
11. Carbon	Rathmell Wilson	J. F. Mears	18,157.3	47	4	6	27	150	25,000
12. Cook	Broad Top Improvement Co	P. Ammerman	2,670.2	..	..	23	10	30	20,000
13. Mount Equity	Riddleburg C. and I. Co	Kemble C. and I. Co	34,239.2	38	18	17	33	130	30,000
14. Duvall Shaft	Rathmell Wilson	" "	....	..	2	37	15	50	50,000
15. Cunard	R. B. Wigton	R. B. Wigton	15,131.2	44	8	19	29	160	50,000
16. Mount Eagle	Reed, Wilson & Co	W. H. Piper	26,645.1	48	9	13	24	130	20,000
17. Scott Shaft	Hon. John Scott	William Scott	....	..	..	11	10	50	45,000
18. Edge Hill	Rathmell Wilson	Dr. Jenkins	490.1	2	..	24	50	200	40,000
19. Delaware	" "	" "	....	..	..	..	15	80	15,000
20. Alexis	Six Mile Run C. Co	A. Gleason	2,222.2	..	..	15	20	100	40,000
	Cumberland Coal over H. B. and T. RR		72,763.1						
	Totals		298,056	377	91	338	505	1,905	$742,000

It appears from this statement that there are no less than fifteen operators contributing to a yearly product of 225,293 tons (in 1873 the output was 350,245 tons) of coal from nineteen collieries, or an average of less than 12,000 tons to the mine. The largest output of any mine during the year was but 37,650 tons. We presume each of these fifteen operators must have his full staff of superintendent, "mine boss," book-keeper, etc., etc. A little army of employees to carry on a business less extensive than is done at any one of a number of our anthracite collieries, or one-fourth less than that done by the Maryland Coal Company of the Cumberland region. It would be interesting to know what the cost of superintendence and general office expenses are per ton of coal in the Broad Top region.

As might be expected in so disorganized an industry, the capital invested in the Broad Top region is altogether out of proportion with the tonnage produced. We have the value of colliery improvements (not the amount of capital invested which would doubtless be very much greater) estimated at $742,000, or nearly $3 30 of improvements for the ton of coal mined, and this without any of the expensive "coal breakers" required in the anthracite region.

If we continue our "figuring" we find the output for the year was nearly 600 tons per miner, or 481 tons per workman employed, including miners, which figures would indicate that the men worked with a little more regularity than in the preceding year when the output was 471 tons per man employed.

It required one mule or horse to every 666 tons produced, or but little less than one for each miner employed. This item alone must have amounted to 30 cents per ton on the coal produced!

The productive capacity of the Broad Top mines is estimated at 1,900 tons per day, or let us say, 500,000 tons per year from 500 working places, or say, 4 tons per day per working place.

It would be extremely interesting to know in items just what Broad Top coal costs per ton in the cars. It seems to us, the business carried on in the wasteful manner these statistics would appear to indicate must have proved very unprofitable during the past year. And this certainly would seem to be an excellent field for the consolidation of interests, the introduction of mechanical haulage, coal cutting machinery and other improvements.

The Great Copper Deposits of New Mexico and Arizona.

THE following interesting description of the recent developments in the wonderful copper region of New Mexico and Arizona, is contributed by Mr. A. HARNICKELL, whose connection with the trade as one of our largest dealers in copper, and particularly his connection with these mines, afford him unusual opportunity for knowing that whereof he speaks. The wonderful abundance and richness of these ores bid fair to make this district famous throughout the world.

With such fabulous mineral wealth as our country, from one end to the other, contains, and with unrivaled agricultural resources, who can question our future national supremacy, and the confidence which the knowledge of these riches must inspire, will be one of the most potent causes for a speedy return of business prosperity at this time.

COPPER MINES IN NEW MEXICO AND EASTERN ARIZONA.

Before the rebellion, already, the "*Santa Rita*" and "*Hanover*" mines were largely exploited—an account of them appears in Prof. RAYMOND's reports. The war broke up this industry, but it has now been resumed in New Mexico and the adjacent portion of Arizona, and bids fair to assume very large proportions ; indeed, when transportation facilities are improved, a business is likely to grow up in that region hardly inferior to that of Chili in copper produce, and of greater magnitude, and more profitable, than that of Lake Superior.

The mountains in which the veins and deposits of copper occur, lie north of the Gila river and between its tributary streams, the Rio Francisco, Prieto, and Bonito in Arizona, extending to near Silver City in New Mexico, and, although at a considerable altitude, they are easily accessible, well watered, timbered and even fertile. The distinguishing characteristics of the geology of the country referring to copper, are simply, that in whatever formation of rock found, the quantities occurring are vast and seemingly exhaustless, while the ores, at any depth thus far reached by the miner, are all of the rich, decomposed varieties. The nature of the copper ore in the veins appears the same on top of the mountain as in the gorge 1000 feet below; the same a few feet below the outcrop as at the bottom of a shaft; richer by far, and in greater volume, than in the famous mines of Urmeneta in Chili. Solid masses of red oxide, copper glance, and true carbonate are the regular ores of the veins, as distinctly separate from the varied gangue rocks of clay, limestone, etc., as the most economical miner could wish, and lavished upon the mountains in truly gigantic proportions. Yellow pyrites are not found as yet, but in several places so much oxidized iron occurs with the glance, as to indicate there a transformation from pyritous minerals. The average yield of the ore dressed by hand is 35, 50, and 70 per cent. of copper ; that of mines on Lake Superior but 2 to 7 per cent.; while, unlike sulphuret ores, these oxidized ores can be smelted almost as readily and cheaply as the concen-

trated native copper mineral of Lake Superior, which, in fact, does not average much higher in percentage of copper.

It is obvious that this great wealth of copper, the richest formation thus far discovered on this continent, must attract attention. But, owing to the distance from railroads, and the greater difficulty than with precious metals, of marketing the products, no general influx of mining adventurers has taken place; but better than this, commercial enterprize has taken hold of some of the mining claims, working them with capital, skilled labor and good management.

Work has been resumed in the "Santa Rita" and enlargement is contemplated; at other places in New Mexico copper is now being mined and smelted, the "San José" and "Chino" mines yielding wonderfully rich ores, while prospectors have discovered other promising croppings and veins in the Burro mountains and further east in the Organdy mountains.

The great mines, however, are over the border in Arizona, within the net of the Gila streams, South of the Sierra Blanca and East of the Cordilleras de Gila, being situate politically in the White Mountain Indian Reservation. Croppings and deposits of carbonate in various places and directions invite and amply merit thorough geological prospecting; thus far, however, only the oro-hydrography of the region has been ascertained and reduced to accurate maps for the use of the Government, and not yet published. This labor, as well as many other difficult tasks, was performed by that splendid corps of explorers, Lieut. WHEELER'S expedition. Two mines, or veins, have been sufficiently prospected and explored; and these alone demonstrate that we have here the wealth of the Chilean mines concentrated in a few miles.

The "*Longfellow*" mine, situate some ten miles west of the P. O. town of Clifton, is a curiosity in its way, and unlike anything thus far found in copper formations. The length of cropping stripped thus far, simply because it is all that appears on the surface, and satisfied all curiosity, is only 250 feet; the length of copper bearing outcrops, in extension of this, however, is admitted to show thousands of feet, giving the idea of a great vein having given rise to them. The ore cropped out along the slope of a mountain and followed the turn of the mountain. The miners have labored hard to find the direction of their vein proper, if it be a vein, but without success: wherever they sunk or tunnelled on the slope of the hill, 60, 80, 100 feet, and more, below the outcrop, and without any dead work, they broke out ore; penetrating 70 feet into the mountain, at a short distance below the outcrop, nothing but ore was found, and the place has thus necessarily been turned into an open quarry, and engineering operations adjourned to 10 years hence. The thing resembles a large iron ore bank, and indeed, iron and clay occur with the copper ore, and such ore! Some 75 tons of it, undressed, were shipped to Baltimore and yielded 35 per cent. of copper. Since then, most of the ore with gangue is thrown aside and only the copper glance and red oxide transported to the smelting works at Clifton, where the Mexican blast furnaces at first used—worked by hand bellows—have given way to reverberating furnaces run by Welsh smelters from Baltimore, who have built a stack 120 feet high and make their own brick. A good water power furnished by the Rio Fresco drives, crushes, etc., and may finally be used for pressure blast engines should half high furnaces be hereafter erected for quick work. Wood being plenty, of great pyrometric value (mesquit) and only a limited business contemplated at present, the reverberatory furnaces are now most convenient. The stock of ore in dumps ready for smelting or in course of transportation by huge waggons from the mine to Clifton, is 1,600 tons, out of which it is reckoned to produce 1,500,000 pounds of pig copper. The mining, or rather quarrying, goes so much ahead of the capacity of smelting and transportation that a pause had to be made, and now it is likely that the miners will have a mind and leisure to push investigation into the lay and dip and bearing of their ore deposit, and to prospect the continuations of it.

The pig copper produced in the crude way was shipped to Baltimore—some 200,000 pounds—and being refined these proved soft and good in quality, as did also that from the New Mexico mines. This is due to the fact that neither antimony, arsenic, nickel or tin occur with the ores of the region.

While this mountain of ore should prepare us for surprises in that locality, it is totally eclipsed by the "*Coronado*" mines, some three miles west of the "Longfellow," and discovered by the party working the latter. The discovery had been kept secret until the land had been cut off from the Indian Reservation by the President of the United States and restored to the Public Domain; this fact being advised by telegraph and swift expresses, a relocation was made by the discoverer, thus securing a virgin title that can never be disturbed.

Here we have a true vein, in a limestone and granite formation, cutting mountains and gorges 9,000 feet long as the crow flies and probably much longer, as a mountain of green carbonates, some miles beyond, seems to lie in the same direction. Gay colored croppings of carbonate plainly define and picture out the course of the vein. Six different names had to be given to the successive locations, viz., "Boulder," "Horseshoe," "Coronado," "Copper Crown," "Crown Reef," "Matilda." The width of croppings varies, averaging 30 feet, widest 135 feet, and narrowest 2 feet at the commencement, which is in Twin Cañon. The vein runs along both sides of the cañon, plainly visible here, of solid red oxide, then ascends the mountain on both sides, one of them rising 1,000 feet perpendicular, trial pits showing copper glance in limestone and other ores of copper along the whole course of the vein for over 13,000 feet superficial. The main work has been done on the "Horseshoe" where the croppings are wide, specimens from the whole width of which, carbonates, assayed over 50 per cent. An adit was here cut 15 feet below outcrop, the bottom of which was found to be *solid* copper glance for 20 feet into the vein, being as far as the work was carried up to the time of my envoy's departure. Curiosity prompted him to turn the adit into a wide open cut, and he found that the smaller veins cropping out had at the depth of 15 feet already run together into one vein, and to all appearances this may continue for the whole width of 135 feet. This show is enormous, almost incredible, but there it now lies bare, ready for anybody's inspection. Enough has been done to show a gigantic ore course, bared in the cañon at 1,000 feet below the highest point, and the same ore shows everywhere. The general course of the vein is northerly, but it varies much from a straight line, and at one point is covered for 600 feet by a landslide.

It is intended to proceed at once with mining and roadmaking, the natural outlet being at the Gila below the mouth of the Fresco, where smelting furnaces and waterworks can be built, wood and clay being plenty.

The only great drawback of the mines, at present, is the distance of the location from railroad transportation. The projected line of the Southern Pacific Railroad runs within a few miles of the mines; that railroad built, ore could simply be shipped to a Texas port, and thence to Baltimore and Europe.

Thus far the cost of mining and smelting has been five cents per pound of copper, and the transportation to Baltimore six cents per pound. The distances are: From Clifton to Silver City, 120 miles; Silver City to Las Cruces, 115 miles; from there to terminus of railroad in Colorado, 650 miles. This distance will be shortened as the railroad progresses toward Santa Fé. All these are mail routes, but the merchandise is transported during eight months of the year by ox and mule transportation, which take copper as return freight at four to five cents, and extra at six cents per pound. The Coronado Company, however, contemplate running a train sufficient to carry 2,000,000 pounds of copper to market.

NEW PUBLICATIONS.

Politics for Young Americans. By CHARLES NORDHOFF. HARPER BROS.

THERE can be no question but that the general perusal and study of this pleasantly written and instructive little book would afford to old as well as young Americans a fuller and more correct appreciation of the duties incumbent on citizens. Though we cannot agree with the author on all point discussed, we can commend the book as well worth perusal by those who do not agree with him as by those who do.

Mr. NORDHOFF is an agreeable and spirited writer, who gives his readers many a home truth in an incisive epigrammatic form, which, though possibly sometimes overdone, in a desire for effect, is yet a pleasant relief in treating of a dry subject.

Mr. NORDHOFF is a strong advocate of the sound and honest system of finance that makes gold and silver the only legal tender money, and is particularly severe on the "More Greenback" policy, in speaking of which he says "the Government issues promises to pay on the plea that it has no money, and it makes them a legal tender because they are not good."

CORRESPONDENCE.

Cornish Mining Captains.

NEW YORK, January 12, 1875.

TO THE EDITOR—SIR: In your issue of January 9th, referring to my communication "the profits of silver mining," you remark: "while our correspondent's history of the 'getting up' of a mining company is too often quite true, we think, he is somewhat too sweeping in his remarks about the 'Cornish mining captains,' some of whom are men of great experience and sound judgment."

It would indeed be matter of deep regret to me if my letter were so construed as to mean a general denunciation of Cornishmen. I am fully sensible of the great contributions to the science of mining engineering by educated Cornishmen. I also fully appreciate the fact that some of the most prominent scientific engineers now living are gentlemen from Cornwall. It would be the height of absurdity to allege that, because a *mining engineer* was a Cornishman or has practised his profession in the mines of that country, he is therefore confined in his knowledge of engineering or economic geology by the limits of his Cornish experience. It is not, however, absurd to allege that experience acquired solely as a mining laborer, or at most captain of a shaft, in a Cornish mine does not make a man competent to report upon the value of any mine. My remarks were intended to apply to this ignorant class, who have frequently left their country for their country's good and endeavor to profit by the high reputation of Cornish engineers by assuming the title of "Cornish mining captain." It is the high reputation made in past years and still sustained by Cornish Mining Engineers which has enabled these men to whom I refer to impose themselves and their cheap services upon the public. The very fact that in my letter of the 31st December I used the term "Cornish Mining Captains" enclosed in quotation marks should have shown what class of persons were being written about. The educated Cornish engineer needs no defence af his abilities, as regards knowledge or judgment. No one appreciates the services he has rendered our profession more than your obedient servant,

D. ERNEST MELLISS, 52 Broadway.

Bessemer Steel Practice.

TROY, New York, Jan. 13, 1875.

TO THE EDITOR—SIR: Thinking you would be pleased to have the accompanying account of what I believe to be the best results yet obtained in Bessemer practice I send it to you, and need not say I feel considerable pride in having brought these works (the first built in the country), up to the head of the business. I am yours truly, ROBERT W. HUNT.

Work was commenced in the Converting Works on Monday evening, December 28th, the blast being put on the cupola at 5 o'clock, and by Saturday evening, or in ten turns, 232 heats were made, yielding 1,140 $\frac{1232}{2240}$ tons of ingots. The several days' results were as follows: Monday night, 19 heats; Tuesday, day run, 20, night turn, 25; Wednesday, day turn, 21, night turn, 27; Thursday,

day turn, 21, night turn, 26; Friday, day turn, 23, night turn, 25; Saturday, day turn, 25, making 232 heats. In the same time the Blooming Mill rolled 246 heats, the work being divided as follows: Monday night, 20 heats; Tuesday, day turn, 25, night turn, 23; Wednesday, day turn, 24, night turn, 29; Thursday, day turn, 25, night turn, 25; Friday, day turn, 26, night turn, 24; Saturday, day turn, 25 heats. So far as we have any information the results obtained in the Converting Works exceed by over ten per cent. the best work af any 5 ton plant in the world. As a proof that no undue strain was put on the machinery, 225 heats yielding 1,101 $\frac{5}{2240}$ tons were made during the following week, ending Saturday, January 9th. On Thursday, January 7th, 55 heats were made, yielding 271 $\frac{905}{2240}$ tons. This is the heaviest yield ever obtained in 24 hours. The day turn in 11 hours made 24 heats, and the night turn 31 heats in 13 hours. On January 13th, 1874, these works made 50 heats in 24 hours and for several months this remained the best ever accomplished until the North Chicago works succeeded in making 52 heats, which gave them the championship, but the fact of 55 heats sends it back again to Troy.

COAL TRADE REVIEW.

Import Duty on Coal.

Anthracite free. *Bituminous*, per ton of 28 bushels, 80 lb. o the bushel, 75c., gold.

All *slack*, or *culm*, such as will pass through a half-inch screen, per ton of 28 bushels, 80 lb. per bushel, 40c., gold.

Not otherwise provided for, per ton, 40c. gold.

This is the only report published that giv s full and accurate returns of the production of our Anthracite mines.

NEW YORK, Jan. 15, 1875.

The Production of Anthracite Coal for the year ending Dec. 31, 1874, was as follows:

Tons of 2240 lb.	YEAR* Tons.
Wyoming Region.	
Delaware and Hudson Canal Co	2 399 417
Delaware, Lackawanna and Western R.R	2,502,769
Pennsylvania Coal Co	1,338,663
Lehigh Valley R.R.	940,987
Pennsylvania and New York R.R	57,596
Central Railroad of New Jersey	1,519,590
Pennsylvania Canal	321,374
Sold at the mines by L. & W. C. Co	34,121
L. & B., South	432,646
	9,547,163
Lehigh Region.	
Lehigh Valley R.R	3,152,651
Central Railroad of New Jersey	1,210,662
Danville, Hazleton & W. B.R.R.,	40 687
	4,404,000
Schuylkill Region.	
Philadelphia and Reading R.R	5,370,300
Shamokin and Lykens Valley	904,536
	6,274,836
Sullivan Region.	
Sullivan and Erie R.R	33,896
Total of all the regions	20,259,895

* Year beginning Jan. 1.

The above table gives all the information of the production of anthracite coal that can be gleaned from the transportation companies' reports. There will be the amount consumed at the mines and in the mining towns to add to the above, which we will estimate and publish in our next issue, after careful enquiries.

The following table does not give the entire production of our bituminous mines, but it is by far the fullest report published.

The Production of Bituminous Coal for the year ending Dec. 31, was as follows:

Tons of 2000 lb., except where otherwise designated.

	Year. Tons.
Cumberland Region, Md.	
Tons of 2240 lb	2,323,223
Barclay Region, Pa.	
Barclay R.R. tons of 2240 lb	337,072
Broad Top Region, Pa.	
Huntingdon & Broad Top R.R	225,293
Clearfield, Region, Pa.	
Snow Shoe	63,540
Tyrone and Clearfield	639,630
Allegheny Region, Pa.	
Pennsylvania R.R	208,094
Pittsburgh Region, Pa.	
West Penn. R.R	194,008
Southwest Penn. R.R	7,880
Penn. and Westmoreland gas coal, Pa. R.R.	911,006
Pennsylvania R.R	445.532
Kanawha Region, W. Va. to Dec. 12.	
Chesapeake and Ohio R.R	140,217

The Production of Coke for the year ending Dec. 31.

Tons of 2000 lb.

	Year. Tons.
Tyrone and Clearfield	849
Alleghany Region	118
West Penn. R.R., " " " " "	46,169
Southwest Penn. R.R " " " " "	430,739
Gas Coal, Penn. R.R. " " " " "	416,000
Pittsburgh Coal, Penn. R.R. " " "	68,377

The demand for Anthracite coal is very light, and prices are badly cut, though there is more firmness to the market than a week ago, if we overlook a bid to furnish the Department of Charities and Corrections of this county, with about 5,500 tons of coal deliverable at the institutions in this city and upon the islands. The lowest bid was by W. ARWOOD at $5.35 for grate, $6.55 for stove, and $5.10 for nut. These prices, when it is considered that the coal is to be delivered, are very low, and indicate that there are some in the trade who do not anticipate much trouble on account of strikes, as the coal is all deliverable before warm weather sets in, and that some company has undoubtedly backed the bidder, or that there is some other way of making money out of the order. From what information we can gain, it is almost impossible to express an opinion on the probable length of the strike. Letters from the Schuylkill and Hazleton regions say that the strike may continue two or three months, while at the same time they mention points of weakness. The following is a quotation from a letter speaking of the financial position of the men, "The poorer ones are hard up now, with no credit at the stores," and numerous other points are given, showing a weakness with a portion of the men; while on the other side there are plenty who can stand a three months' siege. It is quite certain that, as a body, they are not so well prepared for a long strike as in years past, when there were railroads building and other sources of employment for the weak, while now there is no help for them but charity. In the Wyoming Region most of the smaller and all the large companies are at work, excepting the Susquehanna Coal Company, and the Lehigh and Wilkes-Barre Coal Company. Letters from this region indicate that their troubles will not last more than a month.

There is nothing of importance to relate concerning Bituminous coal. It is rumored that 1,500 ton of Cumberland coal have been sold for Cuban shipment. A late arrival of Lancashire steam coal was sold at $5,50 currency.

Freights are more firm, with strengthening tendency, $1.40 having been paid from Elizabethport to Boston, and $2.25 from Baltimore, while $1 .80 has been paid from Baltimore to Providence. Considering the whole freight market, there is a much better demand, and many vessels are accepting cargoes for distant foreign ports, which will keep them from our ports for several months, and finally result in a scarcity of vessels here. From the present outlook freights will rule higher during the coming season than the last half of 1874.

Wholesale Prices of Anthracite Coal for Jan f.o.b. at the Tide Water Shipping Ports per ton of 2240 lb.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
Wyoming Coals.						
†Lackawanna and Scranton at Elizabethport & Hoboken	5 55	5 65	5 75	5 90	6 40	5 35
*Pittston at Weehawken	4 75	4 75	4 85	4 95	5 35	4 50
*Wilkesbarre at Port Johnston	5 55	5 65	5 75	5 90	6 40	5 35
Plymouth, R. A	....	....	5 75	5 90	6 50	5 35
Susque. Coal Co.at Amboy W.A.	5 55	5 65	5 75	5 90	6 50	5 35
Kingston at Hoboken	5 55	5 65	5 75	5 90	6 40	5 35
***Lehigh Coals.**						
Old Company at Port Johnston	6 50	....	6 45	6 45	6 60	5 65
Old Company's Room Run "	6 00	....	6 00	6 00	6 35	5 35
Sugar Loaf at "	6 00	....	6 45	6 45	6 60	5 65
Lehigh Coal Exchange "	6 35	....	6 30	6 30	6 45	5 50
Honey Brook at Elizabethport	6 35	....	6 30	6 30	6 45	5 50
Spring Mt. C. Co. at Hoboken	6 35	....	6 30	6 30	6 45	5 50
Beaver Meadow at South Amboy	6 35	....	6 30	6 30	6 45	5 50
Schuylkill Coals.*						
Schuylkill white ash	5 55	5 65	5 75	5 90	6 40	5 35
Schuylkill red ash	....	....	5 75	5 90	6 50	5 35
Shamokin white and red ash	....	....	....	5 90	6 40	5 35
N. Franklin	....	....	....	....	....	....
Lorberry	....	....	....	....	....	....
Lykens Valley	....	....	....	....	....	....

* Small or Pea coal is quoted by these Companies at $1 35 per ton less than Chestnut.

† f.o. b. in New York Harbor.

* This is the rate for Schuylkill coal deliverable on board vessels at North 9th street, Williamsburgh.

	Per ton.
Freight from Hoboken and Weehawken to New York	40c.
" " Elizabethport & Port Johnston to New York	40c.
" " South Amboy to New York	45 c.
" " Rondout to New York by boat or barges of the D. & H. Canal Co. "delivered"	50 c.

Wholesale Prices of Bituminous Coal.

Domestic Gas Coals.

Per ton of 2240 lb.	At the Shipping Ports.	Alongside in New York.
Westmoreland and Penn, at Greenwich, Philadelphia	$6 25	$7 65
" " at S. Amboy	7 00	..
Red Bank Cannel Pa., at Phil	8 50	8 50
" " at S. Amboy	8 00	....
" Orrel, "	7 00	7 65
" " at Philadelphia	6 25	....
Youghiogheny, Waverly Co, at Baltimore	6 00	7 65
Despard, West Va., "	5 60	7 40
Murphy Run, W. Va. at Baltimore	5 60	7 40
Fairmount, W. Va "	5 60	7 40
Newburgh Orrel, Md. "	5 50	7 40
Cannelton Cannel, W. Va., at Richmond.	11 00	12 50
" Splint, " "	5 25	7 50
Peytona Cannel, " "	....	12 50
Sterling " Ohio	....	12 00
Straitsville, " At Sandusky, O	3 65	11 50

Foreign Gas Coals.

	Sterling.	Am. cur'cy.
Newcastle, at Newcastle-on-Tyne	12/@13/6	7 00@ 8 00
Liverpool House Orrel, at Liverpool	29/	13 00
Ince Hall Cannel "	52/	18 00
" Gas Cannel "	40/	15 00
Scotch Gas Cannel, at Glasgow, nominal.	28/	9 50
	Gold.	
Block House, at Cow Bay, N.S	2 25	6 50
Caledonia, at Port Caledonia	1 87½	5 70
Glace Bay, at Glace Bay	2 00	5 50
Lingan, at Lingan Bay	2 25	6 50
Sydney, International and Reserve mines, at Sydney	2 25	5 75
Pictou, Albion and Vale mines, at Pictou	2 50	6 50

Steam and House Coals.

Broad Top, at the mine, $1 25; at Port Richmond, Phil	4 75@5 00	6 00@6 25
Cumberland, at Georgetown and Alexandria, Va	4 30@4 40	5 75@6 00
Cumberland at Baltimore	4 60@4 75	6 25@6 50
Clearfield, "Derby," "Kitanning" and "Sterling," at the mines, $1 25; at Greenwich, Phil	4 75@5 00	6 25
James River, carbonite, at Richmond, Va	6 75	9 00
" bituminous, "	4 00	6 25

Retail Prices in New York.

Anthracite.

Per 2000 lb.	Grate and Egg.	Stove. Chestnut.
Pittston coal, in yard	$6 00	$6 20 $5 40
*Lackawanna Coal delivered	7 60	7 85 7 10
*Wilkes-Barre, delivered	7 60	7 85 7 10
Lehigh & Locust Mountain, del'd	8 00	8 00 7 50
Schuylkill Red Ash del'd	8 25	

The cost of delivering Pittston coal ranges from 40 cents to $1 per ton, according to distance from the yard.

* Twenty-five cents less than the above rates are charged to manufacturers.

Bituminous.

Liverpool House Orrel, delivered, per ton of 2000 lb				$23 00
Liverpool House Cannel	"	"	"	25 00
American Cannel	"	"	"	16 00
American Orrel	"	"	"	16 00
Straitsville Cannel	"	"	"	16 00
Carbonite	"	"	"	12 00
Cumberland	"	"	"	9 00

Baltimore, Md. Jan. 12, 1875.

Reported by our Special Correspondent.

WHOLESALE PRICES PER 2240 lb.

ANTHRACITE.

	By cargoes.	In cars.
Wilkes-Barre, "Lee," or "Diamond,"		
Lump, steamboat	$5 15	$5 60
Broken	5 50	5 75
Egg	5 87	6 15
Stove	6 07	6 35
Pittston and Plymouth.		
Lump and steamboat	....	5 50
Broken	....	5 70
Egg	....	6 05
Stove	....	6 25
"Boston," freeburning white ash	....	5 50
Egg	5 87	5 70
Stove	6 07	6 05
Shamokin, (red or white ash)	....	6 25
Egg	5 82	6 05
Stove	5 92	6 15
Lykens Valley, red ash, egg and stove	6 02	6 55

From wharf or yard, wholesale, 50@75c. additional.

By retail, all kinds and sizes, per 2,240 lb, $7@8 25.

BITUMINOUS.

George's Creek and Cumberland f. o. b. at Locust Point for cargoes	4 60	4 75
West Va. Gas Coal f. o. b. at Locust Point	5 50	....
Kanawha Cannel, coarse	13 00	....
Tyrone	7 25	....
Ritchie Mineral of West Virginia	1 00	....

The following is a review of the business of 1874, taken from the Baltimore *Journal of Commerce*:

"Owing to the general depression among Northern manufacturers, and the curtailed wants for consumption, the Cumberland coal trade has been considerably affected, notwithstanding the unprecedented low freights of colliers. With a revival of manufacturing interests, now generally anticipated, the coal interests will again be promoted.

Of anthracite, the Northern Central Railroad brought to Baltimore during the year 1874, 232,938 tons, against 242,754 tons in 1873, and 244.757 tons in 1872.

An encouraging feature of the Cumberland coal trade is the continued foreign export demand, shipments for which are a little in excess of those for 1873. We give the exports for the past three years as follows:

	1872. tons.	1873. tons.	1874. tons.
To Pacific Coast	8,949	6,921	12,665
Aspinwall	1,401	600	8,101
Brazil	1,604	898	1,949
Br. N. A. Prov	1,050	1,518	1,465
West Indies	57,761	60,509	30,183
Total	70,675	695,46	54,363

Boston. Jan. 12, 1875.

Reported by our special correspondent.

CARGO PRICES TO TRADE.

Lingan coal	$ 5 75	Westmoreland, and Penn.	7 75
Caledonia	5 00	Waverly Co. Youghiogh'y	7 75
Pictou	6 15	Cannelton Cannel	13 50
Block House	5 60	Cumberland	5 70@ 6 10
Red Bank Cannel	10 00	Anthracite	.6 50@ 7 25
Glace Bay	5 00	" Retail	.7 50@ 8 00
Sydney	7 00		

Buffalo, N. Y. Jan. 12, 1875.

Per ton of 2000 lb.

	Slack.	Nut & Slack.	Nut.	Lump
Connelsville coke				6 50
Sterling cannel				6 00
Red Bank				5 75
Youghiogheny coal for gas				5 50
Briar Hill coal		3 25		5 00
Fairmount "		3 25	3 75	4 25
Catfish "		3 25	3 75	4 25
Stoneboro "	2 75		3 75	

Briar Hill coal, and Stirling and Red Bank cannels retail at $7 50; all other coals $1 per ton above wholesale prices.

Anthracite f. o. b. vessel.

Grate	6 70	Stove	7 15
Egg	6 70	Chestnut	6 65

Retail prices delivered and screened, $1 per ton additional

Chicago, Ill. Jan. 11, 1875.

Specially reported by Messrs. RENO & LITTLE, Coal Merchants.

No change in prices of coal.

Retail prices per ton of 2000 lb. delivered to buyer.

		BITUMINOUS.	
Lehigh Lump	$10 75	Briar Hill and Erie	7 50@ ....
Lehigh prepared and car load lots	10 25	Walnut Hill (W. Va.)	5 50@ ....
Lackawanna, Wilkes-Barre and Pittston,*		Midway (West Va.)	6 50@ ....
Grate, egg, and chestnut.	9 50	Cannel	8 00@ 9 00
Stove or range	10 00	Blossburg	8 00
		Indiana Block	6 00
		Hocking "Brooks"	6 00
		Wilmington and Illinois	5 00

*75 cents off these prices for car load lots to country dealers and manufacturers.

Cleveland, O. Jan. 12, 1875.

Reported by our Special Correspondent.

Per ton of 2000 lb. on cars.

Youghiogheny, l'p	$4 40	Columbiana	$3 00
Youghiogheny, nut	3 40	Strip Vein	3 20
Briar Hill, according to quality	$3 85 to 4 00	Mountain Blossburg (blacksmith)	5 50
Massillon	3 65	American Cannel Coal Co.s Cannel	4 50
Hocking Valley	3 25		
Straitsville	3 25		
Anthracite, Lackawanna on cars,		Egg	$6 85
" " " "		Stove	7 50
" " " "		Chestnut	7 00
Youghiogheny Coke,		here	5 25
Connellsville "		"	5 50

50 to 75 cents per ton additional for delivery at retail.

Cincinnati, O. Jan. 12, 1875.

Per ton of 2000 lb.

	Bush.	Ton.
Youghiogheny, or Pittsburgh, afloat	10 c.	—
Pomeroy coal	7@8 c.	—
Cannel coal	18c.	—
Semi Cannel	11 c.	—

The following are retail prices delivered:

Youghiogheny	13 c.	
Pomeroy	11 c.	
Cannel	24 c.	—
Kanawha Semi Cannel	15c.	—
Anthracite		$9 00@10 00
Foundry coke	10c.	—
Soft coke	8c.	—

Detroit, Mich. Jan. 11, 1875.

Specially reported by Messrs. ROBINSON & KEYS, dealers in all kinds of coal.

The cold weather of the last few days has a decidedly good effect on trade, orders coming in quite briskly. Should the weather continue as now, stocks will be very rapidly reduced. Prices firm, and unchanged.

Per ton of 2000 lb.

Lehigh Lump, per ton	$10 50	Blossburg	8 50
Lehigh " prep. sizes	10 00	Briar Hill	7 50
Wilkes-Barre, Grate and Egg	9 00	Willow Bank	7 00
Wilkes-Barre, Stove and Nut	9 50	Erie	7 50
		Massillon	7 00

Erie, Pa. Jan. 12, 1875.

Reported by our Special Correspondent.

Wholesale, per ton of 2,000 lb.

Bituminous f.o.b.

Briar Hill lump	$4 00	Beaver lump	$4 00

Indianapolis, Ind. Jan. 11, 1875.

Specially reported by Messrs. H. MCCOY & Co.

Per ton of 2000 lb.

BITUMINOUS.

Wholesale on board cars in city.

Block coal	$2 50@$2 75	Indiana cannel	6 75
Best "	2 40@ 2 50	Hocking Valley	4 25
Block Nut, per car	18 00	Youghiogheny	5 00
Highland " "	18 00	Blossburg (smithing)	6 50
Block slack, per car load		Piedmont "	7 75
Peytona, cannel per ton	8 75	Gas coke, per bushel	80

ANTHRACITE (Lackawanna).

Grate	$8 70	Chestnut	8 60
Egg	8 70	Stove	8 85

Retail, per bushel of 70 lb.

Block	16c.	Peytona Cannel	32c.
Highland	14	Indiana "	26
Highland Nut, dom. use	9	Youghiogheny	24
Block " "	9	Blossburg	26
Slack, steam, "	8	Piedmont	30
Block & Highl'd Mt. steam—			

ANTHRACITE.

	per ton.		per ton.
Grate	$11 00	Stove	$11 00
Egg	11 00	Chestnut	11 00

Louisville, Ky. Jan. 12, 1875.

Specially reported by Messrs. BYRNE & SPEED.

Pittsburgh, per load of 1900 lb.	$3 50
Pomeroy	
Buckeye Cannel	5 00
Peytona Cannel	5 75
Nut and Slack	2 50
Kentucky lump, per load	
" nut, "	
" Slack "	
City-made Coke, per bushel	10c
Kentucky on cars at wholesale, per bush.	9c
Anthracite, per ton	$10 to $10 50

Milwaukee, Wis. Jan. 11, 1875.

Specially reported by Messrs. R. P. ELMORE & Co.

The market for coal and prices remain unchanged.

Retail prices per ton of 2000 lb.

Lehigh Lump	$10 00	Briar Hill, select	$8 50
Lehigh Prepared	10 50	Blossburg	8 00
Lackawanna	9 50	Pittsburgh	7 50

New Orleans, La. Jan. 9, 1875.

Nothing of importance to note save a decline in wholesale prices to 38 cents. Rou can repeat balance of our quotations of 2nd inst.

Pittsburgh coal, retail, per bbl	75c
" wholesale	38c.
" to steamboats, per box	60c.
" to manufacturers, per bbl	60@65c.
" shipments per hhd	$7 00
Anthracite, retail, per ton	$12 00@$13 00
" wholesale per ton	$9 00@$10 00
Spadra (Arkansas) coal, retail, per bbl	75c.
Mt. Carbon, wholesale, per bbl	45c.
" retail per bbl	65c.
Virginia Cannel, per bbl	90c.
Scotch Cannel, per bbl	1 00

Pittsburgh, Pa. Jan. 12, 1875.

Reported by our Special Correspondent.

Per ton of 2000 lb. and Bushel of 76 lb.

	per ton.		per ton
Youghiogheny coal	$2 00	Pittsburgh retail delivered per bushel	9c@10c
" coke	2 50		
Connellsville coal	2 10	Anth'cite on cars Lehigh	$7 75
" coke	2 75	" Wilkes-Barre	6 75
Pittsburgh coal	1 85		

Twenty-five to fifty cents per ton additional for delivery.

San Francisco.

From the *Commercial Herald* of December 31.

There is a large railroad consumption of Rocky Mountain, but of which little, comparatively, finds its way into the city, nor a place in our statistics. The Renton mine is being developed at Seattle, while the Lincoln mine is beginning to distribute its product. All the coal of the Pacific slope mines is bituminous. The Mt. Diablo mines furnishing large supplies for steam purposes, while the Bellingham Bay, Coos Bay, Wellington and Nanaimo mines, contribute liberally to local household purposes. Imports for the week embrace the following: *Young America*, 117 days from Liverpool, 1,504 tons; *Fresno*, 1,600 tons from New York; from Newcastle, N. S. W., *Carrick Castle*, 1,270 tons; *Prince Oscar*, 1,820 tons; *Ranee*, 1,650 tons; *Eskdale*, 1,700 tons. We believe all but one of these several cargoes were sold prior to arrival upon terms withheld. The *Doune Castle*, from London, had but 200 tons; the *R. P. Buck*, from Departure Bay, had 1,300 tons; and the *Harvest Home* 912 tons Seattle. The consumption of foreign coals appears to be steadily increasing. Australian has been sold by the cargo at or about $10 50; jobbing at $11@11 25; Cumberland, $16@18; Wellington screened, $11@11 50; Nanaimo, same; Bellingham Bay, $8 50; Coos Bay, $10. The California Mt. Diablo mines, Black Diamond and others at $8 25@6 25 per ton for coarse and fine. We note further arrivals—say 1,770 tons, per *Varuna*, from New South Wales, and 700 tons Nanaimo, per *W. C. Parke*.

Montreal. Jan. 6, 1875.

Reported by our Special Correspondent.

No change has occurred in our bituminous coal market; every body is full, and holders wait for the Spring and its hoped-for revival of manufactures as the only chance of disposing of stocks. In the anthracite trade there has, however, been some excitement. Importations were stopped in the Fall under the impression that the market was over-flooded, and after all it turns out that there is a limited supply of stove and Chestnut sizes Probably there is enough to serve the demand, but it is mostly in two hands, and the price has advanced $1 25 already.

The President of the Grand Trunk Railway, in his recent report, refers to the possibility of the use of anthracite on their engines when new routes of railway from the coal fields are completed. They now require over 50,000 tons per annum at this port, which is wholly supplied from the Lower Provinces. Such a change, though very problematical, would be an important event, and an interesting one in your locality.

Wholesale per ton of 2,240 lb.

Scotch Steam	$6 00	Cape Breton Steam	$5 50
Pictou "	5 75	Newcastle Smiths	7 50

Anthracite at retail, 2,000 lb., delivered, less 5 per cent.

Egg	$8 50	Chestnut	9 00
Stove	9 50		

REVIEW OF THE METAL TRADE FOR 1874.

We have somewhat delayed this review for the purpose of getting the most reliable data, in order to make the review as valuable as possible for reference.

COPPER.—Messrs. F. W. HEYNE & BROTHER report as follows:

	Pounds.
"The stock of copper on Jan. 1, '74, was estimated at	10,000,000
Product from Lake Superior in 1874	33,000,000
Product from Tennessee and Baltimore	4,000,000
	47,000,000
Consumption estimated at:	
January to June, 1874	10,000,000
July to December, 1874	18,000,000
Export	9,006,000 87,000,000

would leave a stock on January 1, 1875, of 10,000,000 of which scarcely 4,000,000 lb. are left unsold in first hands.

"The stock of copper, on the first instant, would thereby appear of the same amount as that of last year; however, the amount remaining in the hands of manufacturers on January 1, 1874, owing to the crisis, which occurred in September, 1873, was probably by three million pounds larger than now, the business in the latter part of 1874 having improved to such a degree, that no accumulation could take place.

"From January to April the price of Lake Superior copper ruled at 24@25c. per lb. In April, several mining companies contracted to deliver from June to September inclusive, ten million pounds of copper at 23c, but the market price remained at 24½@24c. until late in July, when, by the failure of the purchasers of the before-mentioned large quantity, the price broke down to 19@19½c. The purchase of large quantities of copper at these figures, for export and home consumption, brought the price up again in August to 21c., from which time, by the development in the manufacture of brass and copper goods, the market advanced steadily, until it closed at the end of the year at 23¼@23½c. for immediate, and 24c. for January to April delivery.

"But not only in this country, also in England and the Continent of Europe, the consumption of copper has increased by the extension of railroads and by the introduction of the use of metallic cartridges in the large armies of Europe. Notwithstanding our annual export of 4,000 tons ingot copper, the stock of copper in England in November, 1874, had decreased about 6,000 tons, and the price had advanced in consequence, from £85 for "best selected" in May, to £95 in December, and only by the high bank discount in London of 6 per cent., a further advance was restricted; the charters of a couple of thousand tons more from Chili would have had no effect whatever. The high rate of discount in London, however, cannot be maintained for any length of time; there has been no overtrading anywhere, and rather less money should be required by the trade than previously, in consequence of the shrinkage of values of the principal staple articles. The only reason we can see for this high rate of discount is the demand (or expectation of a demand) for gold from Germany on the Bank of England, in consequence of the change of the money system in Germany from the silver to the gold standard, which went into operation on the first instant.

"Be this as it may, we are not dependent of more or less shipments of copper from Chili, nor of the discount in London. Our shipments of copper from Lake Superior have been stopped by the advent of Winter, and of money we have enough at present at a moderate discount.

"The position of the copper market is a sound one. The general stock of raw and manufactured copper is smaller than last year; the price is 1½c. per lb., lower than at the corresponding time of last year, and, what is of still greater importance, manufacture of brass and copper goods is again in full operation."

EDWARD A. CASWELL, Esq., in connection with his published diagram showing the fluctuations of the market during the past year, gives the prices of Chili bars in England, on the last Saturday of each month, as follows: January, £81 10/; February, £77; March, £76; April, £75 10/; May, £73; June, £79 10/; July, £77; August, £76 10/; September, £80; October, £83 10/; November, £88; and December, £84. On the first Saturday in January of last year the price in England was £83, so that the year closed with an advance of only £1. Mr. CASWELL takes the production of Lake Superior copper ore, as published in the *Portage Lake Mining Gazette* of November 26, 1874, and estimates the yield at 77 per cent., or 34,654,433 lb. To this he adds 1,500,000 lb. of Tennessee copper (an estimate given by the President of the company), 2,000,000 lb. Baltimore, 1,000,000 lb. Vermont (the two latter estimates given by POPE, COLE & Co., of the Baltimore Copper Co.), and 250 000 lb. New Mexico copper, or a total of 39,304,433 lb., from which he deducts ingots exported 6,500,000 lb., and copper in cartridges about 2,500,000 lb., leaving for home consumption, 30,304,433 lb. There is quite a difference between the amounts of export as given by the Messrs. HEYNE and Mr. CASWELL, the former placing the amount at 9,000,000 lb., and the latter at 6,500,000 lb. Mr. CASWELL claims to have the official Custom-House returns, while the Messrs. HEYNE claim to know just what quantity was exported, and say that about 1,200,000 lb. were omitted from the Custom-House entries.

Mr. A. HARNICKELL, in his review, says:

"Business in copper seems very promising, and stocks are not excessive—in fact held in such strong hands, that a healthy business is guaranteed, and consumers need have no fears of having purchases decline on their hands; on the contrary, if the promises are realized, a quiet but steady advance in prices may be looked for during the first half of 1875.

"The production of this country will grow larger as railroads are pushed ahead in the far West and South-West. California is turning out rich ores, and in New Mexico and Arizona mines as great as those of Chili have been discovered, and are actually being worked now, limited by the present means of transportation. The Baltimore Smelting Works are prepared for a large business and now also treat argentiferous and auriferous copper ores, while their cake and ingot copper again enjoy the reputation they had under Dr. KEENER.

"Any surplus copper we may hereafter produce will, it seems, be wanted in Europe."

TIN.—The demand throughout January and February was light, with prices rather steady at about 27¼@28c. for Straits; 26@26¼c. for L. & F.; 27c. for English Refined; and 31¾c. for Banca. The English market during this time had declined from about £120 for Straits, to £99, with a corresponding decline in the other brands, and, as might be expected, its influence was felt here, so that by the first of March, lots to arrive during March and April were offered at 25c., without finding purchasers. The decline in the English market continued through March, and on the 25th of that month, the

Dutch Trading Company sold, at Amsterdam, 19,400 slabs of Banca at an average of fl.54, equal to £95 in London, which had a depressing effect on the market, so that, at the end of the month, the London quotations were: Straits, £90 10/; English Refined, £94; and L. & F., £92. This showed a decline of about £30, or 25 per cent. in three months, and, as would be anticipated, threw considerable uncertainty over the market, and the article was rather avoided. This resulted in prices in this market, as follows: Straits in store 24¼c., to arrive 23c; English Refined in store 22½c., to arrive 22c.; L. & F. 21¼c. in store, and 20¾ to arrive. During the early part of April, the decline continued until Straits reached £85, when a sharp advance set in, and this brand reached £105, again declining and closing at £100. During the early portion of the month, the business done was entirely of a jobbing nature, while during the latter part there were from 6,000 to 7,000 slabs of different brands reported as sold, of which from 3,000 to 4,000 slabs of Straits were at 24c., to arrive. English Refined closed at 22½c; L. & F., 21¾c.: and Banca, 26¼c. During May the transactions were light, being confined to the wants of consumers, and the price gradually gave way in this market, although the foreign market was without material change. English Refined closed at 22c.; L. & F., 21c.; Banca, 26c.; and Straits, 23¼c. During June there was no activity, although a good jobbing demand prevailed, and prices all round were about the same as during May. Prices both here and in England began to decline under a light demand; on the 30th of July, Messrs. HOLMES & LISSBERGER'S failure was announced, and August opened with still greater depression, so that Straits were nominally quoted at 22¾c.; English Refined, 21¾c.; L. & F., 21c.; and Banca, 25@25½c. Following this, about the middle of the month, was the sale of from 3000 to 4000 slabs of hypothecated Straits at 21¼c., which, when out of the market, permitted the month to close with the figures upon which it opened and with a much better jobbing demand. During September, prices both here and in England declined a little, and closed here at 21¾c.@22c. for Straits; 21¼c.@21½c. for L. & F.; and 21c.@21¼c. for Refined English. The decline continued through October, so that at the end of the month the quotations here were: Straits, 12¼c.@21½c.; English Refined 21¼c. L. & F. 21c. and Banca 25c., while in London the prices were as follows: L. & F. £97; Refined English £99; Straits £92. Prices remained weak until about the third week of November when it was rumored that large transactions had taken place, and although the particulars were kept private, it had an improving influence. In the last week of the month it came to the public's knowledge that about 5,000 slabs of Straits on spot, and 10,000 slabs to arrive, had been sold at 21¾c.@21¾c. This had the immediate effect of advancing prices to 22¼c. for Straits; 21¾c. for L. & F.; 22c. for English Refined; and 26c. for Banca. During the first week of December there were sales of 2,000 slabs of Straits to arrive at 21¾c., and 500 on spot at 22c., which gave additional strength to the market of about ¼c., assisted by the news of the sale of 20,100 slabs of Banca, by the Dutch Trading Company, at 58½ florins per 50 kilos, which was considered a very satisfactory figure. With an additional sale of about 1,200 slabs of Straits, part to arrive, at 22c.@22¼c., the market was without change to the end of the year, closing firmly at: Straits, 22½c.; Refined English, 22c.; L. & F., 21¾c.; Banca, 26c., while the London quotations were: Straits, £94; L. & F., £99@£100.

A perusal of the above would indicate that the business of the past year had been an unprofitable one, and that but few, if any, who had handled tin largely have come off without loss.

Lead.—Messrs. PERKINS, SCHMIDT & Co., in their review of 1874, say:

"The consumption of pig lead in 1873, in and from New York, Boston, Philadelphia and Baltimore, was apparently 36,000 tons.

"But, from various causes, there were in warehouse and in an unused form, belonging to manufacturers, and not counted as stock, at the close of the year		2,500 tons.
which made the real consumption		33,500 "
If, now, we take these	2,500 tons,	
and add stock, Jan. 1, 1874	3,500 "	
	6,000 tons,	
add imports	18,000 "	
" Government sales	4,000 "	
" Receipts of domestic lead	13,000 "	
	41,000 tons,	
and deduct stock, Jan. 1, 1875	4,000 "	

we show a consumption in 1874 of (ton of 2240 lb.) 37,000 tons.

"From what we can learn of the production of lead in what we call the Galena District, we believe there has been somewhat of a falling off there; but the production in Missouri has made up the deficiency, though the year's production is hardly more than in the previous year. Without doubt, St. Louis has been rather lower than other markets, but this was caused by the weight of surplus stock which a diminished consumption could only slowly work off. We believe that now there are only comparatively small stocks, and a revival in trade must bring prices nearer to a remunerative scale.

"The revival of trade in lead, and all its manufactures, is dependent upon the course of trade in general. We incline to believe that the business in pig lead, this year and last, represented in the main merely the necessary demands of the people at a time when values, generally speaking, have undoubtedly been shrinking, and included no part of the natural increase which comes in every country as it grows in numbers, wealth and intelligence, requiring thereby the use of lead in its various forms, as of other metals, to an extent beyond mere necessity. This natural increase may be checked for a time, but the country don't stop growing.

"American lead has largely supplied the demand for common lead, but the trade must not overlook the fact that the Government has largely supplied that demand also; which has, at the same time, very much unsettled values. The Government has now less than 3,000 tons available stock left, and it is not unreasonable to suppose that prices for domestic will approximate more closely to the cost of importation as soon as the Government stock is out of the way.

"The market opened in the beginning of the year with the price for domestic at about 6 cts.@6¼ c. gold, but declined to $5 65 gold upon the announcement of new Government sales. The price has however gradually advanced as the receipts of domestic began to fall off; until, at the close of the year, $6 35 gold was demanded for the Government, and for most of the stock of domestic, though sundry small lots could be had at 6¼ c.

"In Europe we have seen the market gradually advance from £20 in May, to £24 in December, for common lead in London. This rise has been brought about with an entire absence of speculation. In England, the production has fallen off from an average of about 70,000 tons per annum, to 53,000 tons, while the supply from Spain has been very much diminished by the political troubles in that country. Meantime, to the regular demand for lead for painting, plumbing, etc., has been added the wastage of war, and the restocking of forts and arsenals with new and improved arms, which has had an effect upon lead as upon copper, both of which enter largely into the manufacture of cartridges.

"During the year, common foreign lead has sold as low as 6¾ c.; but is now 6⅞@6 9-10, in sympathy with the rise in London."

Spelter.—During January and February there was but a fair jobbing business, and by March, Foreign had declined from 7½c. gold, the opening price, to 7⅛c., and Domestic from 8c. currency to 7¾c. Prices tended downward during March and April, with considerable business in Foreign at prices less than cost of importation. The prices May 1st were: Silesian 6¾@6¾c. gold, and Domestic 7¼@7¼c. currency. May opened with but little Foreign on spot, and firm; and from 150@200 tons on the way, mostly sold. At the close of the month, Foreign was without change in prices, although Domestic, from neglect, had weakened to 7@7¼c. During June, the transactions were quite large on consumptive account, and the month closed with Foreign at 6¾@7¾c. gold, and Domestic 6¾@7c. currency. From this time to the 1st of November, the business was but moderate, and the prices closed at 6¾@6¾c. currency, for Domestic, and 6¾@7¼c. gold for Foreign. In the early part of November, considerable transactions in Foreign took place at 6⅞@7¼c. gold, while Domestic remained dull throughout the whole year, as did Foreign after the middle of November. The closing prices of the year were: Domestic 6¾@6¾c. currency, and Foreign 7@7¼c. gold. Mr. WM. PAULSEN gives the following statistics of Foreign Spelter: Importation 1050 tons, as compared with 2400 tons in 1873, 4300 tons in 1872, and 3600 in 1871. Stock Jan. 1st, 1874, 350 tons, and Jan. 1st, 1875, 135 tons; thus showing the amount delivered for consumption, in 1874, to be 1265 tons.

IRON MARKET REVIEW.

New York.

Jan. 15, 1875.

American Pig.—There is a decided improvement in this article; the demand is greater than it has been since this time last year, and prices are from $1@$2 a ton higher than at the opening of this year. In January of last year we had a "spurt" which only lasted during that month, and then prices took the downward tendency; although great hopes were given to dealers, and considerable speculative transactions took place. The transactions since January 1st., 1875, have been entirely for consumption, which gives them a better appearance than those of last year, and it is to be hoped that we will not open February of this year with the report of nothing but dullness, and weakness to prices. The transactions that have taken place so far, have been a few orders of good dimensions; and the makers who received them are few, so that from many we hear the report of the same dullness that characterized the market during last year. It is customary for the Thomas Iron Company to make considerable sales in January, and as they are the largest recipients of orders, it can hardly be stated that the general demand has greatly increased, although we have been shown numerous inquiries in a small way, at figures below the ruling quotations. There is certainly some improvement of a healthy nature, and the outlook has a tendency to give more strength to prices; but it must be born in mind that an anticipated coal strike of sufficient length to compel some of the furnaces to blow out, has brought out orders from some parties for their wants during that period, and again it has been used by the furnace companies as a pretext to advance prices. The stocks of Lehigh iron are pretty well reduced, but it is quite doubtful if the consumptive requirements of the market for the next two months will take the production of the furnaces, now in blast, and as they cannot live entirely upon hopes, there will again be a depressed feeling even though prices may not materially decline. We have been shown figures of the cost of production which would show a loss with Gray Forge at $23; No. 2 Foundry, at $24, and No. 1 Foundry, at $26. With lower rates of transportation and prices of coal, the cost of production will be reduced, so that if a demand springs up, and prices are materially advanced, additional furnaces will likely be blown in, thereby producing, perhaps, a surplus, which would naturally tend to bring upon the market prices that would yield no profit to the makers. There is nothing, at the present moment, to indicate that the furnaces of Lehigh Valley, New Jersey and New York will be unable to procure coal; but they may not be able to get the particular brands they desire. The colliery owners of the Wyoming Region will take great pleasure in furnishing them with all the lump they want, instead of running it through their rolls as they have been doing most of last Summer. The Thomas Iron Company have, taken orders since January 1st., for about 15,000 tons of iron, of which in previous issues, we reported 5,000 tons. Their latest sales have been 2,000 tons Gray Forge at $21 at the works, prompt cash, 1,300 tons No. 2 Foundry at $23@$24, and some No. 1 Foundry at $26, the two latter at Hoboken. Their lowest prices now are: No. 1 Foundry, $26; No. 2 Foundry, $24@$25; and Gray Forge nominally at $23, all at Hoboken. They will not, in anticipation of the coal strike, sell any but their regular customers at the above figures, and for Gray Forge they cannot accept orders at present, as they are sold ahead for three months, and, in fact, have had to refuse orders for from 2,000 and 3,000 tons. They have on their books orders for all kinds to the amount of about 30,000 tons. In addition to the above there were sold 4,000 tons of Lehigh and 2,000 tons of Hudson River forge irons at prices not given; 600 tons of No. 1 Crane at $26; 600 tons of No. 1 Allentown at $26; and 2,000 tons Lehigh brands, No. 1 Foundry at $25 50@$27.

Scotch Pig.—There is nothing doing in this article; the wants of those using this class of iron have certainly not increased, and it is not affected by the anthracite coal strike, so there is nothing to give it life. Coltness is quoted on spot at $39@$40; Glengarnock, $38; Eglinton, $34@$35. If the demand for American pig were a healthy one, it is quite probable that a corresponding improvement would be felt in Scotch.

Rails.—There have been no transactions and in the absence of business and the unsettled state of affairs, we would call prices nominal.

Old Rails.—Nothing doing, and prices are without change. The only stock in this city is held at $31; while mills in Pennsylvania can purchase at $29@$30, delivered.

Scrap Iron.—We note sales of 1,400 tons at $28; 500 tons, at $30; 200 tons, at $31; and 200 tons at $33. No. 1 scraps may now be quoted at the latter figure, from yard. This is said to have cleaned out all irregular and inferior lots, and to have left but a light stock of good No. 1 in dealers' hands. It is said that the majority of the mills are not well stocked, and as the cost of importation is about $37, with any increase in the demand, the price here will naturally approximate that figure. The future of this article is more flattering than any upon our list.

Boston.

Jan. 9, 1875.

From the *Commercial Bulletin*.

"Pig is very dull, and round lots could likely be found on our wharfs at $27 cash for No. 1, and $24 50 for No. 2. The reports from Hoboken are of the same vacillating character which has marked the business at that point since the middle of December, and credited rumor points to offers to ship 100 ton lots No. 1 reliable brands at $24, and $22 25 for No. 2. In gray forge there is very little doing but lots here are apparently strong at $20 while nothing is now known at shipping points for less than $18, fully $2 better than the lowest point a week ago."

Chicago.

Jan. 15, 1875.

Specially reported by Messrs. ROGERS & Co., dealers in Scotch and American pig iron.

Quotations are as follows:

No. 1 Coltness	$46 00@	....
No. 1 Gartsherrie	45 00@	....
No. 1 Summerlee	44 00@	....
No. 1 Glengarnock	42 00@	....
No. 1 Eglinton	40 00@	....
Warner's "American Scotch"	41 00@	....
Massilon No. 1 Foundry	37 00@	....
No. 1 Grand Tower Mo. ores (Bituminous)	33 00@	....
No. 2, " " "	30 00@	....
No. 1 Mill	28 00@	....
Union "A" 1 (Anthracite)	32 00@	....
Union "B" 1 (Anthracite)	30 00@	....
No. 1 Lake Superior (charcoal)	32 00@	....
No. 2 Lake Superior "	30 00@	....
No. 3 Lake Superior "	33 00@	....
No. 4 Lake Superior "	35 00@	....
Bessemer Steel Rails	85 00@00 00	
New Iron Rails	55 00@	...
Old Rails	28 00@30 00	

The Chicago *Railway Journal* says:—"There has been no change in the pig and bar iron markets, and no likelihood of any improvement soon. Prices still tend downward when not absolutely at a standstill.

"RAILS.—There is considerable inquiry from excellent sources for steel rails in this market, and large orders have been given by the Illinois Central, Chicago & Alton; Chicago, Rock Island & Pacific, and Chicago & Northwestern Roads. The North Chicago mill has orders sufficient to keep them running full force nearly if not quite through the year, aggregating over 28,000 tons. The Joliet mills have a good supply of orders, including one for 6,000 tons for the Chicago & Alton.

The Union Rolling Mill has shut down for the purpose of replacing their old building with a new one of iron, being erected by the American Bridge Co. They will resume operations about the middle of February or first of March. Iron rails are in no demand, and may be fairly quoted at $55. Steel rails are quoted at $75, and manufacturers are confident of a successful season, and seem to have excellent reason for it."

Cincinnati. Jan. 12, 1875.

Specially reported by Messrs. TRABER & AUBERY, commission merchants for the sale of pig iron, blooms, ore, etc.

The following are the closing quotations of our pig iron market, viz.:

CHARCOAL.

Hanging Rock, No. 1, Foundry	$27 00@28 00—4 mos
" No. 2, "	25 00@26 00—4 mos
" Mill	24 00@25 00—4 mos
Tennessee No 1, Foundry	26 00@27 00—4 mos
Tennessee. No. 2 "	25 00@26 00—4 mos
" Mill	24 00@25 00—4 mos
Missouri, No. 1, Foundry	28 00@30 00—4 mos

STONE COAL.

Ohio No. 1, Foundry	26 00@27 00—4 mos
" No. 2, "	25 00@26 00—4 mos
Ohio Mill	24 00@25 00—4 mos
Missouri, No. 1, Foundry	27 00@29 00—4 mos
" No. 2, "	25 00@26 00—4 mos
" Mill	24 00@25 00—4 mos

CAR-WHEEL.

Hanging Rock, C. B.	45 00@52 00—4 mos
Tennessee "	40 00@45 00—4 mos
Missouri "	40 00@45 00—4 mos
Alabama "	40 00@45 00—4 mos

BLOOMS.

Charcoal	75 00@ 90 00—cash

SCRAP IRON.

Cast	75@ 85—cash
Wrought	1 00@ 1 25—cash

Louisville. Jan. 12, 1875.

Specially reported by Messrs. GEORGE H. HULL & Co.

The market is dull and lower. We revise quotations as below.

The usual time, 4 months, is allowed on the quotations below.

HOT BLAST—CHARCOAL.

No. 1 foundry, from Hanging Rock ores	$26 00@28 00
No. 2 " " "	24 00@25 00
No. 1, forge, " "	23 00@24 00
No. 1, foundry, " Tennessee "	25 00@26 00
No. 2 " " "	24 00@25 00
No. 1, forge, " "	23 00@24 00
No. 1, foundry, " Alabama "	25 00@28 00
No. 1 " " Iron Mountain "	28 00@30 00

HOT BLAST—STONECOAL.

No. 1, foundry, from Missouri ores	28 00@30 00
No. 2, " " "	27 00@28 00
No. 1, forge " "	26 00@27 00

COLD BLAST—CHARCOAL.

Wheel from Hanging Rock ores	40 00@50 00
" " Tennessee "	35 00@38 00
" " Alabama "	38 00@40 00
" " Georgia "	38 00@40 00
" " Missouri "	38 00@40 00
" " Kentucky "	30 00@40 00

San Francisco.

From the *Commercial Herald*, Dec. 31, 1874.

The *Dauntless*, for New York, carried 3,600 pigs of Selby's Refined Lead. The Selby Smelting Works, at North Beach, are of large capacity, and susceptible of being increased very considerably to conform to the growing wants of the Pacific slope. But a small quantity of the lead now produced is manufactured or consumed here, the great bulk of it is sent to New York. However, the Selby Shot-tower Works supply all the lead pipe, sheet lead, and bar lead consumed on the coast, and keeping prices down to a point that cuts off all supplies from the East and elsewhere. Pig iron is said to be in light stock with a large consumptive requirement and this is likely to be greatly augmented in the near future. Oregon pig iron sells as fast as it arrives at $46; Eastern soft, $43.50; Scotch may be quoted at $40, to arrive, and for spot parcels, $42.50@47.50, according to quality and brand; some extra brands of Scotch are jobbing as high as $50. Tin plate is in large stock and prices both low and nominal; very little demand at present. The steamship *Mikado* from the Colonies brought us 541 ingots of tin, which appears to be finding its way into general use, but at low prices as compared with Banca or Straits tin.

Pittsburgh, Pa. Jan. 12, 1875.

Specially reported by A. H. CHILDS, Esq., commission merchant for the sale of pig iron, blooms, ore, &c.:

The past few days have developed more inquiry for pig iron than for several weeks preceding. Consumers seem to have come to the conclusion that bottom has been reached and that the present is a good time to lay in supplies for future needs, so that although the lock-out continues in full force, there are many anxious to secure good gray forge at $21@$22, 4 mos., or one dollar per ton off for cash. Holders, however, are quite firm at $23, and it would not take very large purchases at this prices to cause an advance.

From the *American Manufacturer* of Jan. 14.

PIG IRON.

There has been some little stir in pig iron during the past week; we understand that several round lots have been sold, but, as might be expected, in the present condition of affairs, at a lower range of prices. Some of our manufacturers have been buying, not that they need it, but because they considered it good property at the prices at which it was offered, hence they are discounting future wants, from which it is evident that they do not expect prices to go much lower. There is no inducement for the mills to stock up now, except the one in question, low prices, as the lock-out is still in existence, and there is no telling when it will be dissolved; it may not last another week and it may hold out for months, as both the manufacturers and puddlers are very obstinate, and at present there is not the slightest indication of weakness on either side, nor the slightest disposition to make any concessions. There are but few sellers at the decline; and, as a rule, it is only those furnacemen who are embarcassed and are forced to realize, that will accept the prices in question, $20@21. It is claimed that, notwithstanding the reduced cost of manufacture, the rates in question do not more than cover actual cost, if that, under the most favorable circumstances hence the feeling prevails more or less that in the event of a dissolution of the lock-out and the starting up of all the furnaces, the market will stiffen and prices possibly advance. Sales of gray forge have been made within the past week at 20@$21 cash, and $22, 4 mos; we heard of a sale of one thousand tons having been closed on Saturday last at $20, cash, and there appear to be more buyers than sellers at the price in question. We were informed by an operator, within a very few days, that he had been endeavoring to pick up some good mill iron at the price named, but up to that time he had been unsuccessful. Producers generally are holding at $22, cash, and $23 4 months., but we opine that it would be even more difficult to sell at these figures than it would be to buy at $20@$21 cash and .

MANUFACTURED IRON.

Trade in finished iron is fair, and while it cannot be called active it is about all that can be reasonably expected. Some of the mills are reported as being pretty well supplied with orders, while others are not so fortunate, although it is claimed that there is little or no margin for profit at current rates and that if it were not for keeping up their trade, it would just be about as well if they were all stopped. Prices continue weak in sympathy with the raw article but have undergone no change; quotations may be given on a basis of $2 25@$2 30 for merchant bar.

PIG METAL SALES REPORTED FOR THE AMERICAN MANUFACTURER FOR THE WEEK ENDED JAN. 13, 1875.

BITUMINOUS COAL SMELTED FROM L. S. ORE.

30 tons	No. 1 foundry	$25 00—4 mos
500 "	gray forge	23 00—4 mos
450 "	gray forge	22 00—4 mos
500 "	gray forge	21 50—4 mos
2000 "	gray forge	20 00—cash.

ANTHRACITE.

200 tons	No. 1 foundry extra	$28 00—4 mos

CHARCOAL.

20 "	No 1 foundry, H. B.	$32@33—4 mos
200 "	No 1 & 2 foundry	P. T.
50 "	No 1 foundry, H. R.	P. T.
10 "	No 2 foundry, H. R.	29 00—4 mos
35 "	Cold Blast, H. R.	P. T.
5 "	Cold Blast, Va.	40 00—cash.

MUCK BARS.

200 tons		$44 50—4 mos
300 "		43 00—cash.
300 "		42 00—4 mos
300 "		41 50—4 mos
650 "		P. T.

NOTE.—In our reports very little of the iron made in the city is included, as in most instances the parties owning the furnaces use the iron in their mills. This will add from 3,000 to 3,500 tons per week to our report.

METALS.

NEW YORK, January 15, 1875.

Gold Coin.—During the week past gold has ranged from 112¾ to $1.12⅛, and closed yesterday at $1.12⅛.

Bullion.—Fine silver bar is quoted at $1.25⅛@$1.26¾; gold, per ounce, and fine gold bar at par ($20.67 gold per ounce) to 1-16 per cent. discount.

Copper.—The market is rather quiet, and as the demand is not sufficient to meet what is offering from the hands of small speculators, it is weak. We note sales of 50,000 lb. January and February delivery at 22⅞c.; 200,000 lb. at 22½c., cash; and 75,000 lb. at 23c cash on the 15th and 20th. Chili Bars are still quoted in London at £84. The stronger and larger holders here are firm at 23c., anticipating a much better trade by the 1st of next month. Messrs. VIVIAN YOUNGER & BOND, under date of London Dec. 26, 1874, say: "On the 22d the usual cablegram with Chili advices was received, announcing the charters for all November as 5,000 tons fine copper, being 2,600 tons for the second half of that month, instead of 1,300 tons as had been reported. These very large charters from Chili during the last three months begin to attract considerable attention, and seem to point to an accumulation of stocks on that side of somewhat alarming proportions. Since early in October, when they should have heard in Chili of the price of about £80, the total charters say for three months amount to about 14,500 tons."

Tin.—The market is very quiet, although quite firm. Straits are quoted at 22½@22¾c.; Refined, 22@22¾c.; L. and F. 21¾; Banca, 26¾c., all gold. By cable from London, Straits on spot are quoted at £95 5/, and to arrive (about 3 months) £94; L. and F. £100@£101; Straits at Singapore, $25@$25 25 per picul, and re-smelted tin at Penang, $24 40. In tin plates there has been a fair business, mostly in a jobbing way. I. C. charcoal are quoted at $10, gold; charcoal roofing, $9; coke tin, $8; coke ternes, $7 50@$7 75. Cable information states that four tin plate mills are on strike, but that they hope to arrive at an adjustment soon. Should this strike continue any length of time, and become somewhat general, prices both here and abroad will probably advance considerably.

Lead.—The sales of domestic have not aggregated more than from 40@50 tons at from $6 12½@$6 25, while in foreign there has been nothing doing. The market for domestic is very weak, and although $6 12½ is the asking price, it is more than probable that $6 10 to $6 00 would be accepted for a round lot. Foreign is firmly held at 6¾c. for ordinary and 7¼c. for fine, with but very little stock here.

Spelter and Zinc.—There is nothing much doing in either Foreign or Domestic Spelter. The former is quoted at 7c.@7¼c. gold; Western at 6¾c.@6¾c., currency: Refined Lehigh and New Jersey 11c.@11½c., currency. We note sales of about 20 tons of Western at 6¾c.@6¾c. Sheet zinc is quiet but firm at 9½c.@6¾c., gold

Antimony.—This article is quiet but firm at 12¼c., gold, with light stock The London quotation is now £53.

Magnanese.—Samples of Pyrolusite from Utah have been sent here and prove to be of high percentage. N. B. Manganite is quoted at 3c.; Va. Psilomelane, 2c.

Quicksilver.—This article is without change, the quotations being $1 65 per lb., in this city; $1 55 in San Francisco, and £26 per flask (75 lb.) in London. The San Francisco *Commercial Herald* of Dec. 31, says: "We note recent shipments to Mexico of 300 flasks. The available supply is steadily increasing, and prices incline to ease off. The present nominal price is $1 55."

Miscellaneous Stocks.

NEW YORK, Jan. 14, 1875

The general tendency of the following list during the past week has been upward, with the average amount of transactions. We note a sale at auction, yesterday, of $10,000 St. Louis and Iron Mountain 1st mortgage 7 per cent. bonds at 94½, also $4,000 Delaware and Hudson Canal 1st mortgage 7 per cent. bonds at 106¾. Market closed to-day unsteady and weak. The following quotations represent the highest and lowest prices during the operations of the week and closing prices to-day.

	Highest.	Lowest.	Closing.
Pennsylvania Coal Co	—	—	245
Consolidated Coal Co	42¼	42½	—
Spring Mt. Coal Co	67½	65	—
American Coal Co	59	50	—
Maryland Coal Co	19¾	19	—
Cumberland Coal and Iron Co	48	—	—
N. Y. & Nova Scotia Iron Co	116	—	—
Del., Lack. & West. R.R. Co	107¾	107¼	107½
New Jersey Central R. R. Co	107	106½	107
Delaware and Hudson Canal Co	118¾	118	118¾
Quicksilver Mining Co. prefrd	43	—	—
" " " Common	34¾	34	34

PHILADELPHIA, Jan. 13th, 1875.

The market for the following securities, during the week under review, has been comparatively quiet. We note but few alterations in quotations as compared with our last.

The managers of the Schuylkill Navigation Company announce a scrip dividend of 60 cents per share on the preferred stock and 30 cents per share on the common stock, payable after the 1st proximo. This scrip will be convertible after March 18, 1875, in sums of $100 and upward, into the mortgage loans of 1879—97. The Schuylkill Valley Navigation and Railroad Company announces a dividend of 2½ per cent., payable on the 14th instant.

The quotations below represent the highest and lowest prices during the week, and also closing prices to-day. Market closed unsettled.

	Highest.	Lowest.	Closing
Reading R. R. Co	—	—	54⅞
Lehigh Valley R. R. Co	61½	61	61⅜
Little Schuylkill R. R	47½	47¼	47¾
Catawissa R.R. Preferred	41¾	41	41
Delaware Division Canal	52½	51¾	52½
Morris Canal	—	—	50
Schuylkill Canal preferred	—	—	13⅞
Susquehanna Canal	7	6	7
Lehigh Coal and Navigation Co	49⅞	49⅜	49⅞
Westmoreland Coal Co	—	—	91

Boston Stock Market.

BOSTON, Jan. 14, 1875.

A decline of $2 per share in the Copper Falls Mining Co. is the only item of interest worthy of note in the following report. A sale of 190 shares of the Franklin Mining Co. occurred yesterday at 7¼, and small sales of Allouez were made at $8 per share.

Allouez	—	Pewabic	—
Calumet and Hecla Co.	144¾	Phœnix	12
Copper Falls	9⅛	Quincy	44
Central	27	Ridge	7
Franklin	—	Rockland	1

San Francisco Stock Market.

An advance of $3 per share in the Imperial Mining Co. is the only exception to a decided decline of the Comstock list. California leads the downward movement with a fall of $155 per share as compared with our last report. Consolidated Virginia and Ophir are respectively $75 and $63 per share lower than reported in our last. The whole list sympathises with this remarkable decline of the favorite stocks. A dividend of $2 per share has been declared by the Crown Point Mining Company, payable Jan. 12.

The following quotations, per telegraph, are dated San Francisco, Jan. 13, 1875:

Gould & Curry	63	California	610
Savage	152	Overman	80
Chollar Potosi	70	Raymond & Ely*	26
Ophir	227	Eureka G. V.*	8
Hale and Norcross	55	Best & Belcher	69
Crown Point	45	Kentuck	20
Yellow Jacket	143	Meadow Valley*	6
Belcher	51	Alpha	33
Imperial	20	Sierra Nevada	21
Consolidated Virginia	625	Union Consolidated	73

* These quotations are dated Jan. 11th.

American Institute of Mining Engineers.

OFFICIAL BULLETIN.

Announcements to Members and Associates.

I. The ENGINEERING AND MINING JOURNAL, which is the Organ of the Institute, and contains its proceedings, transactions and notices of meetings, will be sent to each Member and Associate on the payment of his annual dues. Back numbers cannot, as a rule, be sent.

II. Dues (ten dollars per annum) are payable on election and at the annual (May) meeting. Members and associates elected at the February meeting pay ten dollars only to May of the following year. Remittances should be made, as far as possible, by P. O. Order, payable to the Secretary.

III. The Council earnestly requests members to forward to the Secretary, for preservation, copies of all printed mining and geological reports, particularly pamphlets, which may fall in their way. It is believed that by this means a large amount of valuable fugitive information concerning different regions and properties in this country, may be caught and preserved.

IV. Blank proposals for membership can be had on application to the Secretary.

V. The first volume of Transactions of the Institute will be sent by the Secretary to any address, on the receipt of five dollars.

VI. Members are earnestly requested to inform the Secretary promptly of any change of address.

THOMAS M. DROWN, Secretary, Lafayette College Easton, Pa.

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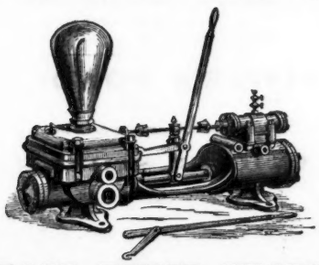

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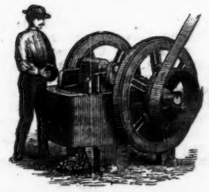

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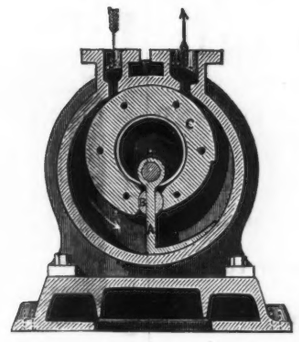

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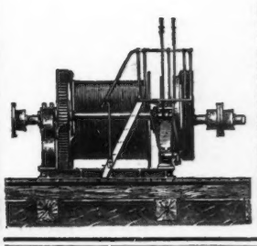

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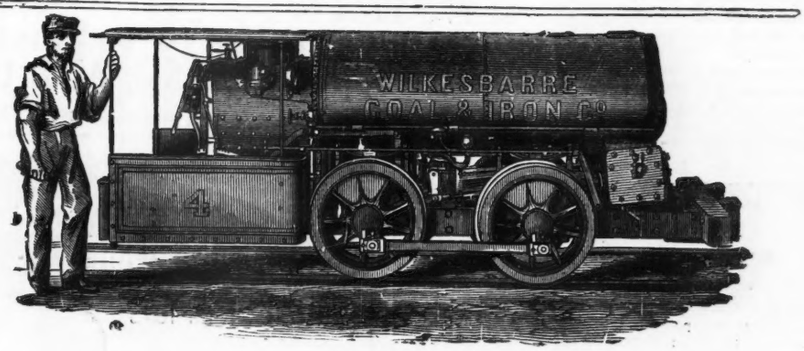

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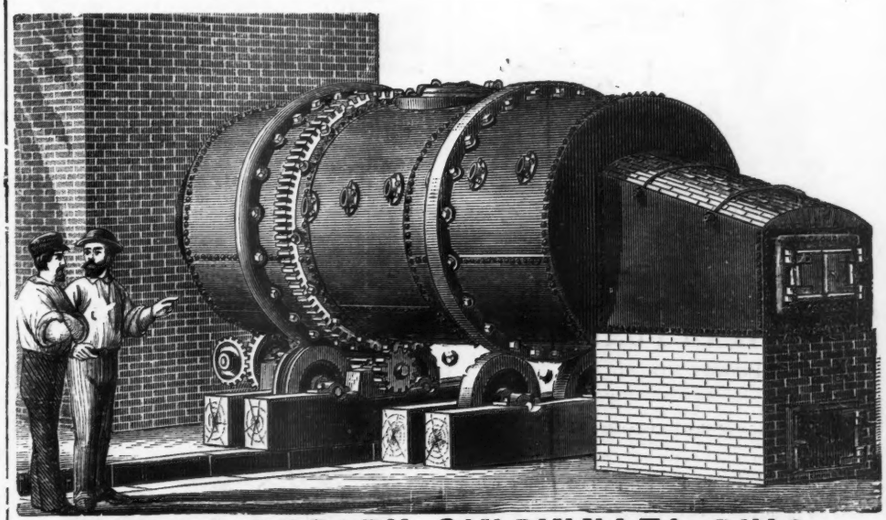

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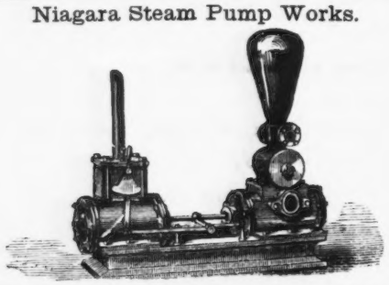

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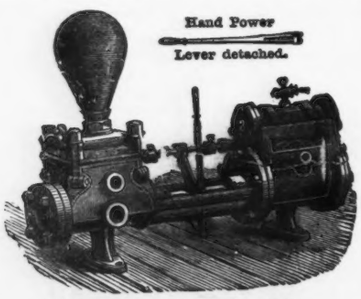

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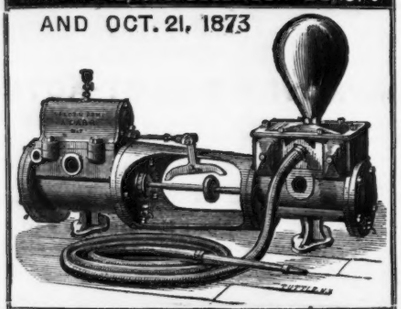

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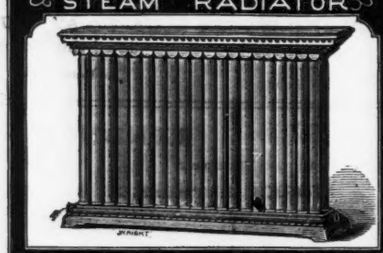

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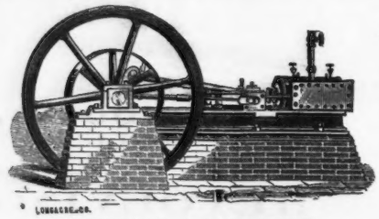

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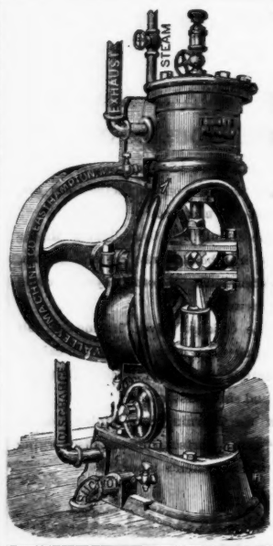

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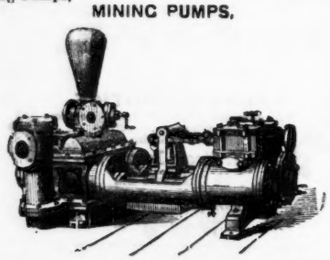

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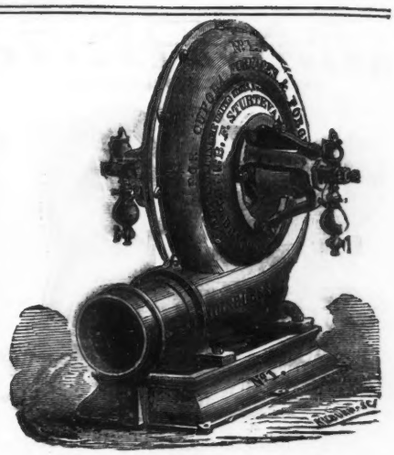
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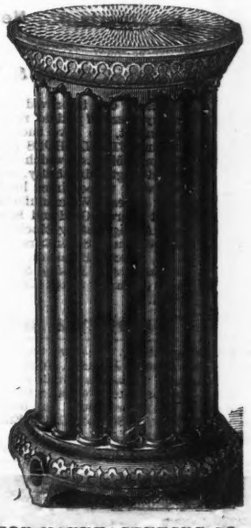
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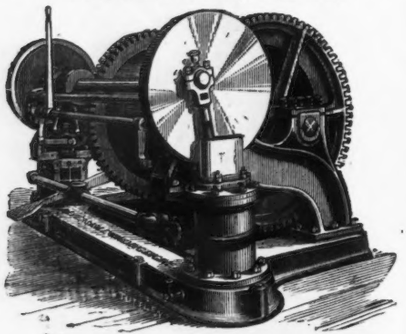

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☞ Look at following extract, Ingersoll Co.'s letter of excuses, ENGINEERING AND MINING JOURNAL, June 6, and compare with their advertisement: "I had *two* drills at the mine from the commencement, one beginning work on the 4th of April, the other on the 7th of the same month, and both drills working until the 1st of May." Signed, C. N. ELLIOTT, Superintendent Ingersoll Rock Drill Co.
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